

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2019

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission File Number 001-36352

AKEBIA THERAPEUTICS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)
245 First Street, Cambridge, MA
(Address of principal executive offices)

20-8756903
(I.R.S. Employer
Identification No.)
02142
(Zip Code)

Registrant's telephone number, including area code: (617) 871-2098

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value \$0.00001 per share	AKBA	The Nasdaq Global Market

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES NO

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES NO

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES NO

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). YES NO

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES NO

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant, based on the closing price of the registrant's Common Stock on The Nasdaq Global Market on June 28, 2019, was \$565,808,424.

The number of shares of registrant's Common Stock outstanding as of March 1, 2020 was 129,858,262.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Proxy Statement for the registrant's 2020 Annual Meeting of Stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K.

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NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements that are being made pursuant to the provisions of the U.S. Private Securities Litigation Reform Act of 1995 with the intention of obtaining the benefits of the “safe harbor” provisions of that Act. All statements contained in this Annual Report on Form 10-K other than statements of historical fact are forward-looking statements. These forward-looking statements may be accompanied by words such as “anticipate,” “believe,” “build,” “can,” “contemplate,” “continue,” “could,” “should,” “designed,” “estimate,” “project,” “expect,” “forecast,” “future,” “goal,” “intend,” “likely,” “may,” “plan,” “possible,” “potential,” “predict,” “strategy,” “seek,” “target,” “will,” “would,” and other words and terms of similar meaning, but the absence of these words does not necessarily mean that a statement is not forward-looking. These forward-looking statements include, but are not limited to, statements about:

- the potential therapeutic benefits, safety profile, and effectiveness of our product candidates, including the potential for vadadustat to set a new standard of care in the treatment of anemia due to chronic kidney disease;
- the timing, investment and associated activities involved in continued commercialization of Auryxia;
- the potential indications, demand and market potential and acceptance of our product and product candidates, including our estimates regarding the potential market opportunity for Auryxia, vadadustat or any other product candidates and the size of eligible patient populations;
- the potential therapeutic applications of the hypoxia inducible factor, or HIF, pathway;
- our pipeline, including its potential, and our research and development activities;
- our competitive position, including estimates, developments and projections relating to our competitors and their products and product candidates, and our industry;
- our expectations with respect to (i) the anticipated financial impact and potential benefits to us related to our merger with Keryx Biopharmaceuticals, Inc., or Keryx, that was completed on December 12, 2018, or the Merger, (ii) integration of the businesses subsequent to the Merger, and (iii) other matters related to the Merger;
- our expectations, projections and estimates regarding our capital requirements, need for additional capital, financing our future cash needs, costs, expenses, revenues, capital resources, cash flows, financial performance, profitability, tax obligations, liquidity, growth, contractual obligations, the period of time our cash resources and collaboration funding will fund our current operating plan, internal control over financial reporting and remediation of any deficiencies, and disclosure controls and procedures;
- the timing of the availability and disclosure of clinical trial data and results;
- our and our collaborators’ strategy, plans and expectations with respect to the development, manufacturing, commercialization, launch, marketing and sale of our product candidates, and the associated timing thereof;
- the designs of our studies, and the type of information and data expected from our studies and the expected benefits thereof;
- the timing of or likelihood of regulatory filings and approvals, including labeling or other restrictions;
- our ability to maintain any marketing authorizations we currently hold or will obtain, including our marketing authorizations for Auryxia and our ability to complete post-marketing requirements with respect thereto;
- our ability to negotiate, secure and maintain adequate pricing, coverage and reimbursement terms and processes on a timely basis, or at all, with third-party payors for Auryxia or any other product candidate that may be approved;
- the targeted timing of enrollment of our clinical trials;
- the timing of initiation of our clinical trials and plans to conduct preclinical and clinical studies in the future;
- the timing and amounts of payments from or to our collaborators and licensees, and the anticipated arrangements and benefits under our collaboration and license agreements, including with respect to milestones and royalties;
- our intellectual property position, including obtaining and maintaining patents; and the timing, outcome and impact of administrative, regulatory, legal and other proceedings relating to our patents and other proprietary and intellectual property rights, as well as Abbreviated New Drug Applications filed by generic drug manufacturers and potential U.S. Food and Drug Administration Approval thereof, and associated patent infringement suits that we have filed or may file, or other actions that we may take against such companies, and the timing and resolution thereof;

- expected reliance on third parties, including with respect to the development, manufacturing, supply and commercialization of our product and product candidates;
- accounting standards and estimates, their impact, and their expected timing of completion;
- estimated periods of performance of key contracts;
- our facilities, lease commitments, and future availability of facilities;
- cybersecurity;
- insurance coverage;
- our employees, including our management team, employee compensation, employee relations, and our ability to attract and retain high quality employees;
- the implementation of our business model, current operating plan, and strategic plans for our business, product candidates and technology, and business development opportunities including potential collaborations, alliances, mergers, acquisitions or licensing of assets; and
- the timing, outcome and impact of current and any future legal proceedings.

Any or all of these forward-looking statements in this Annual Report on Form 10-K may turn out to be inaccurate. These forward-looking statements involve risks and uncertainties, including those that are described in Part I, Item 1A. Risk Factors included in this Annual Report and elsewhere in this Annual Report on Form 10-K, that could cause our actual results, financial condition, performance or achievements to be materially different from those indicated in these forward-looking statements. Given these risks and uncertainties, you should not place undue reliance on these forward-looking statements. Forward-looking statements speak only as of the date of this Annual Report on Form 10-K. Except as required by law, we assume no obligation to publicly update or revise these forward-looking statements for any reason. Unless otherwise stated, our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

This Annual Report on Form 10-K also contains estimates and other information concerning our industry and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Unless otherwise expressly stated, we obtained this industry, market and other data from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data and similar sources.

In this Annual Report on Form 10-K, unless otherwise stated or the context otherwise requires, references to “Akebia,” “we,” “us,” “our,” “the Company,” and similar references refer to Akebia Therapeutics, Inc. and, where appropriate, its subsidiaries, including Keryx.

AURYXIA®, AKEBIA® Therapeutics and their associated logos are trademarks of Akebia and/or its affiliates. All other trademarks, trade names and service marks appearing in this Annual Report on Form 10-K are the property of their respective owners. All website addresses given in this Annual Report on Form 10-K are for information only and are not intended to be an active link or to incorporate any website information into this document.

Item 1. Business**Overview**

We are a biopharmaceutical company focused on the development and commercialization of renal therapeutics for people living with kidney disease. Our portfolio includes a late-stage product candidate and a commercial product:

- **Vadadustat** is an investigational, oral hypoxia-inducible factor prolyl hydroxylase inhibitor, or HIF-PHI, in global Phase 3 development for two indications: (1) anemia due to chronic kidney disease, or CKD, in adult patients on dialysis, or DD-CKD, and (2) anemia due to CKD in adult patients not on dialysis, or NDD-CKD. We believe vadadustat has the potential to set a new oral standard of care for patients with anemia due to CKD, subject to regulatory approval. Vadadustat is designed to mimic the physiologic effect of altitude on oxygen availability. At higher altitudes, the body responds to lower oxygen availability with stabilization of hypoxia-inducible factor, or HIF, which can lead to red blood cell, or RBC, production and improved oxygen delivery to tissues.
- **Auryxia® (ferric citrate)** is approved and marketed in the United States for two indications: (1) the control of serum phosphorus levels in adult patients with DD-CKD, or the Hyperphosphatemia Indication, and (2) the treatment of iron deficiency anemia, or IDA, in adult patients with NDD-CKD, or the IDA Indication. Ferric citrate is also approved and marketed in Japan as an oral treatment for the improvement of hyperphosphatemia in patients with CKD, including DD-CKD and NDD-CKD, under the trade name Riona® (ferric citrate hydrate).

If the results of our global Phase 3 studies for vadadustat are positive, we plan to file for regulatory approval in the United States and other regions. In connection with our plan to file for regulatory approval for vadadustat in the United States, we entered into a letter agreement on February 14, 2020, or the Letter Agreement, with Vifor (International) Ltd., or Vifor Pharma, relating to Vifor Pharma's agreement with a third party to purchase a Priority Review Voucher, or the PRV, issued by the U.S. Food and Drug Administration, or FDA, subject to satisfaction of customary closing conditions, or the PRV Purchase. A PRV entitles the holder to priority review of a New Drug Application, or NDA, or a Biologics License Application for a new drug, which reduces the target FDA review time to six months after official acceptance of the submission, and could lead to expedited approval. Pursuant to the Letter Agreement, we will pay Vifor Pharma \$10.0 million within fifteen business days after the closing of the PRV Purchase. Vifor Pharma is obligated to retain all rights to, and maintain the validity of, the PRV until we and Vifor Pharma (a) enter into a definitive agreement setting forth the financial and other terms by which Vifor Pharma will assign the PRV to us for use with our planned NDA for vadadustat for the treatment of anemia due to CKD in both DD-CKD and NDD-CKD patients, or (b) make a mutual decision to sell the PRV and share the proceeds based on certain terms.

We plan to commercialize vadadustat, subject to FDA approval, in the United States with our existing nephrology-focused commercial organization, while also leveraging our collaboration with Otsuka Pharmaceutical Co. Ltd., or Otsuka, and its U.S. commercial organization. We also granted Otsuka exclusive rights to commercialize vadadustat in Europe, China and certain other markets, subject to marketing approvals. In Japan and certain other countries in Asia, we granted Mitsubishi Tanabe Pharma Corporation, or MTPC, exclusive rights to commercialize vadadustat, subject to marketing approvals. In addition, we granted Vifor Pharma an exclusive license to sell vadadustat solely to Fresenius Kidney Care Group LLC, or FKC, which manages approximately 40% of the dialysis patients in the United States, at its U.S. dialysis clinics, and to certain third party dialysis organizations in the United States, approved by us, or Third Party Dialysis Organizations, which account for up to an additional 20% of the dialysis market in the United States. The license granted to Vifor Pharma would be effective upon FDA approval of vadadustat in the DD-CKD indication, the earlier of a determination by the Centers for Medicare & Medicaid Services, or CMS, that vadadustat will be included in Medicare's bundled reimbursement model or that vadadustat will be reimbursed using the Transitional Drug Add-On Payment Adjustment, or TDAPA, and a milestone payment by Vifor Pharma.

We market Auryxia in the United States with our well-established, nephrology-focused commercial organization. Our Japanese sublicensee, Japan Tobacco, Inc., or JT, and its subsidiary, Torii Pharmaceutical Co., Ltd., or Torii, commercialize Riona in Japan.

We were incorporated in 2007 under the laws of the State of Delaware. On December 12, 2018, we completed a merger, or the Merger, with Keryx Biopharmaceuticals, Inc., or Keryx, combining a nephrology-focused commercial organization with our robust development organization. Following the Merger, Keryx is our wholly owned subsidiary, and we are integrating our business and Keryx's business with the goal of positioning Akebia to realize the potential growth opportunities and synergies from the Merger.

Strategy

Our mission and our culture are centered around the goal of improving the lives of people impacted by kidney disease, through the discovery, development and commercialization of innovative therapeutics. Our strategy is to execute on the following initiatives, which we believe will create significant market opportunities for us:

- **Complete the global clinical development of and successfully commercialize vadadustat for the treatment of anemia due to CKD.** We believe vadadustat has the potential to address limitations of injectable erythropoiesis-stimulating agents, or ESAs, and set a new oral standard of care for the treatment of anemia due to CKD, subject to regulatory approval. We are conducting a global Phase 3 clinical development program for vadadustat. Our collaboration partner, MTPC, recently completed its Phase 3 clinical development program for vadadustat in Japan and submitted a Japanese New Drug Application, or JNDA, in the third quarter of 2019 for the treatment of anemia due to CKD. We expect to read out top line data from our global Phase 3 studies beginning with INNO₂VATE in the second quarter of 2020, and then PRO₂TECT in mid-2020. If these results are positive, we believe that these studies will support filings for regulatory approval in the United States and other regions. We believe we are well positioned to commercialize vadadustat in the United States with our nephrology-focused commercial team, as well as our partnership with Otsuka, and through our agreement with Vifor Pharma, subject to FDA approval. We plan to support Otsuka's and MTPC's commercialization of vadadustat in Europe, Japan and certain other markets, subject to regulatory approvals. We retain full commercial rights to vadadustat in Latin America, allowing us maximum flexibility in the region.
- **Grow adoption of Auryxia within its approved indications.** We aim to continue to use our nephrology-focused commercial organization to increase awareness, demand and adoption for Auryxia for its approved indications with key stakeholders including nephrologists, third-party payors, dialysis organizations, patients and their families. We also believe that reinstating Medicare coverage of Auryxia for the IDA Indication would allow for greater adoption of Auryxia in both of its approved indications. See Part I, Item 3. Legal Proceedings for further information with respect to our efforts.
- **Leverage Auryxia as a clinical catalyst and commercial beachhead for vadadustat, in CKD.** In addition to bringing meaningful clinical benefits to patients, Auryxia provides strategic value to Akebia by allowing us to leverage our existing nephrology-focused commercial footprint and deepen key customer and prescriber relationships that we believe will be important for the future commercialization of vadadustat, if approved, and other potential future renal products.
- **Expand our pipeline and portfolio of renal therapeutics to advance care for people living with kidney disease.** We aim to add to our pipeline and portfolio of renal therapeutics through internal discovery and development, and through strategic transactions, such as in-licenses, collaborations and acquisitions. Our pipeline and portfolio expansion efforts will be guided by our purpose to improve the lives of people impacted by kidney disease.

Our management team has extensive experience in developing and commercializing drugs for the treatment of renal and metabolic disorders, a deep understanding of the renal space and biological pathways involved in kidney disease including HIF biology and iron metabolism, and broad business development expertise. With this management team, fully integrated capabilities spanning research, manufacturing, development and commercialization, a commercial revenue stream and a strong balance sheet, we are well positioned to execute on our strategy.

Background on Kidney Disease

Kidney disease is an area of major unmet need globally, driving massive healthcare costs and with a generally poor prognosis: eventually many patients will progress to a stage where they are dependent on dialysis, with high morbidity and a significant increase in mortality rate.

Kidney disease can be caused by a number of distinct and concomitant factors, including cardiometabolic disorders (primarily diabetes and hypertension), genetic kidney diseases, autoimmune disorders, and aging. Given the prevalence and growth rates of these various underlying conditions, kidney disease prevalence is expected to continue to increase globally. In the United States, chronic kidney disease significantly impacts the U.S. healthcare system, affecting about 37 million patients and costing Medicare over \$120 billion annually in 2017 for treating Medicare beneficiaries with CKD of end-stage renal disease. The U.S. Department of Health and Human Services has recognized the national pandemic and partnered with the American Society of Nephrology to found the KidneyX Innovation Accelerator, a public-private partnership to improve the lives of the 850 million people worldwide currently affected by kidney diseases by accelerating innovation in the prevention, diagnosis and treatment of kidney diseases.

Most of the conditions covered by the term "kidney disease" may lead to dependence on dialysis or kidney transplant for survival, causing renal failure, directly or indirectly, by accelerating the onset of CKD. Dependence on dialysis is associated with a significant increase in mortality and hospitalizations, and a significant reduction in quality of life for patients. There is a clear need to improve the clinical and quality of life outcomes for people living with kidney disease. It is our vision, in time, to provide or contribute to better alternatives that improve the lives of people impacted by kidney disease.

As a first step towards our vision, we aim to advance care for patients with CKD, which is the current focus of our pipeline and portfolio of approved indications.

CKD is a condition in which the kidneys are progressively damaged to the point that they cannot properly filter the blood circulating in the body. This damage causes waste products to build up in the patient's blood leading to other health problems, including anemia, cardiovascular disease and bone disease. As illustrated in the table below, CKD patients are categorized in one of five stages based on the degree of their loss of kidney function as measured by the glomerular filtration rate, or GFR, and the level of protein in the urine, referred to as albuminuria.

Stages and Prevalence of Chronic Kidney Disease in the United States

Stage	Description	GFR (mL/min/1.73m ²) ^a	U.S. Prevalence Rates ^{b, c}	Estimated Number of U.S. Patients (millions) ^{d, e}
1	Kidney damage with normal or increased GFR	≥90	4.6%	11.2
2	Kidney damage with mildly decreased GFR	60-89	3.0%	7.3
3	Moderately decreased GFR	30-59	6.7%	16.4
4	Severely decreased GFR	15-29	0.4%	1.0
5	Kidney failure (includes non dialysis, dialysis and transplant)	<15 (or dialysis)	0.3% (calculated)	0.7

Sources:

- a GFR categories defined in the August 2012 Kidney Disease Improving Global Outcomes Clinical Practice Guideline for Anemia in Chronic Kidney Disease, p. vii.
- b U.S. Prevalence Rates for Stages 1-4 based on averages of data from 2011-2012, 2013-2014, and 2015-2016, CDC CKD Surveillance System, National Health and Nutrition Examination Survey, or NHANES.
- c U.S. Prevalence Rate for Stage 5 is based on a calculation using estimated number of U.S. patients with ESRD from 2018 U.S. Renal Data System Annual Report, as set forth in this table, and U.S. population data for people 20 years and older from www.census.gov.
- d Estimated Number of U.S. Patients for Stages 1-4 based on the 2018 U.S. Prevalence rates, as set forth in this table, as applied by Akebia to U.S. population data for people 20 years and older from www.census.gov.
- e Estimated Number of U.S. End-Stage Renal Disease Patients from 2018 U.S. Renal Data System Annual Report.

The prevalence and incidence of CKD is increasing in all segments of the United States population. Risk factors for the development of CKD include concomitant diseases such as hypertension, diabetes mellitus and cardiovascular disease, lifestyle factors such as tobacco use and inactivity, family history, aging and prenatal factors such as maternal diabetes mellitus, low birth weight and small-for-gestational-age status. According to an article in *The Lancet* published in May 2013, projected worldwide population changes suggest that the potential number of cases of CKD, specifically end-stage, will increase disproportionately in countries such as Japan, China and India where the number of elderly people is increasing. This effect will be accelerated further if the growth in the prevalence of hypertension and diabetes persists, along with the associated increased risk of stroke and cardiovascular disease, and access to treatment does not improve.

The progression of CKD towards renal failure is complicated by multiple conditions which further deteriorate kidney function and the general health of patients if left untreated. Typically the prevalence of these conditions increases as CKD progresses. For instance, anemia is characterized by low hemoglobin levels and is typically associated with a worsening quality of life, increased hospitalizations and increased mortality. The prevalence of anemia increases with the severity of CKD from an estimated 20% in patients with Stage 3 NDD-CKD to an estimated 95% in patients with Stage 5 DD-CKD.

Anemia, or low hemoglobin/red blood count, in patients with CKD most commonly arises from two etiologies:

1. Anemia due to CKD: results from inadequate levels of EPO, a protein hormone synthesized by specialized cells in the kidney that stimulates production of red blood cells in the bone marrow. As renal function declines, the body progressively loses the ability to produce endogenous EPO; and
2. IDA: results from low levels of iron due to abnormal iron absorption and utilization in patients with CKD.

Anemia due to CKD in NDD-CKD and DD-CKD patients are the two indications being investigated in Phase 3 clinical trials for vadadustat, and IDA in adult patients with NDD-CKD is an FDA-approved indication for Auryxia.

Hyperphosphatemia is another condition associated with CKD that is characterized by elevated serum phosphorus levels and is also typically associated with a worsening of health including increased cardiovascular risk and increased mortality. Hyperphosphatemia in DD-CKD patients is also an FDA-approved indication for Auryxia.

In addition to these conditions that are the current focus of our pipeline and portfolio of approved indications, there are several other disorders that have deleterious consequences on patient's health, including hypercalcemia, hyperkalemia, hyponatremia, hypernatremia, and hyperparathyroidism. These conditions are generally not well controlled, particularly in the later stages of CKD and as patients transition to dialysis.

When considering the clinical and commercial opportunities in CKD, it is important to take note of the contrasting market dynamics between DD-CKD and NDD-CKD.

DD-CKD patients receive treatment for the various complications of CKD including anemia and hyperphosphatemia. Given the concentration of dialysis clinics in large networks, with DaVita and Fresenius Kidney Care accounting for a vast majority of the dialysis population in the United States, treatment is usually driven by medical protocols that are rolled out across the entire network of clinics. These protocols are informed by very large data sets and when updated, result in rapid change applicable to large segments of the patient population. This is particularly true of medications covered under the End Stage Renal Disease, or ESRD, Prospective Payment System, or PPS, in Medicare, or the ESRD Bundle, a payment structure with a flat base rate per dialysis session adjusted for individual patient and facility characteristics. Dialysis-related drugs are included in the ESRD Bundle if they fall into functional categories such as anemia management and bone and mineral metabolism, except that oral-only drugs are exempted from inclusion until 2025. In a final ESRD PPS rule published in November 2018, CMS confirmed that it will expand the Transitional Drug Add-On Payment Adjustment, or TDAPA, to all new dialysis drugs approved by the FDA after January 1, 2020. The TDAPA will provide separate payment for new drugs for two years based on the drug's Average Sales Price, ASP, that will be added to the base rate in order to facilitate the adoption of innovative therapies. Although there are several details that need clarification, the rule provides support for our assumption that new anemia treatments, including the HIF-PHI class, will be included in the ESRD Bundle and will be eligible for separate payment initially under TDAPA.

In contrast, NDD-CKD is characterized by larger patient populations with lower treatment rates for CKD-related conditions. In addition to improving cardiovascular risk and quality of life, unmet need includes delaying the progression of CKD and therefore the transition to dialysis. Reimbursement in the non-dialysis setting aligns with traditional commercial and government payer reimbursement for outpatient drugs.

Vadadustat

Overview

Vadadustat is an investigational oral HIF-PHI product candidate in global Phase 3 development for two indications: anemia due to CKD in adult patients with DD-CKD, and anemia due to CKD in adult patients with NDD-CKD. We believe vadadustat has the potential to set a new oral standard of care for patients with anemia due to CKD, subject to regulatory approval. Vadadustat is designed to mimic the physiologic effect of altitude on oxygen availability. At higher altitudes, the body responds to lower oxygen availability with stabilization of HIF, which can lead to RBC production and, improved oxygen delivery to tissues. The significance of the HIF pathway was recognized by the 2019 Nobel Prize and the 2016 Albert Lasker Basic Medical Research Award, which honored the three physician-scientists who discovered the HIF pathway and elucidated this primary oxygen sensing mechanism that is essential for survival.

Market Opportunity

Anemia due to Chronic Kidney Disease

Anemia is common in patients with CKD, and its prevalence increases with disease progression. Anemia due to CKD results from inadequate EPO levels, which negatively affect RBC production. Left untreated, anemia accelerates overall deterioration of patient health with increased morbidity and mortality. Based on third party prevalence data and company estimates, approximately 37 million people in the United States have CKD and approximately 5.7 million of these individuals suffer from anemia. The current standard of care for anemia due to CKD is treatment by injectable recombinant human ESAs, such as EPOGEN® (epoetin alfa) and Aranesp® (darbepoetin alfa), or blood transfusion. Based on publicly available information on ESA sales and market data compiled by a third-party vendor, global sales of injectable ESAs for all uses were estimated to be approximately \$6.1 billion in 2018. The vast majority of these sales are believed to have been for the treatment of anemia due to CKD.

When administered to a patient, injectable ESAs provide supraphysiological levels of exogenous EPO to stimulate production of RBCs. While injectable ESAs can be effective in raising hemoglobin levels, they have the potential to cause significant side effects, and need to be injected subcutaneously or intravenously. In particular, injectable ESAs may lead to thrombosis, stroke, myocardial infarction and death. While these safety concerns, which became evident starting in 2006, have led to a significant reduction in the use of injectable ESAs, injectable ESAs remain the current standard of care for both NDD-CKD and DD-CKD patients with anemia.

NDD-CKD Market

Data from the U.S. Renal Data System, orUSRDS, 2015 Annual Data Report indicate that the collective injectable ESA treatment rate in NDD-CKD patients in the United States decreased by approximately half from 2009 to 2013. As a result of the safety concerns associated with ESAs, today, a high proportion of NDD-CKD patients with anemia are either not treated or inadequately treated despite having low hemoglobin levels. In contrast to treatment with ESAs, we believe vadadustat, subject to regulatory approval, has the potential to expand the number of NDD-CKD patients receiving treatment by offering an alternative oral treatment for anemia due to CKD with a differentiated safety profile.

DD-CKD Market

According to the USRDS 2019 Annual Data Report, there were approximately 524,000 patients in the United States on dialysis in 2017, of which 88% were on in-center hemodialysis and the remainder on peritoneal or home hemodialysis. ESAs are given to approximately 90% of in-center hemodialysis patients and 75% of peritoneal dialysis patients.

There is an unmet need for treatment options for patients with anemia due to CKD that offer a differentiated and/or improved safety profile, and such agents would have significant market potential.

Vadadustat Has the Potential to Set a New Oral Standard of Care

We believe that, based on the HIF-PHI mechanism of action and clinical data to date, vadadustat has the potential to set a new oral standard of care for the treatment of anemia due to CKD within both the NDD and DD markets. Below is a summary of the key clinical findings; further details are included below.

- *Vadadustat stimulated endogenous EPO production.* In two Phase 1 studies in normal healthy volunteers and one Phase 2 study in CKD patients, vadadustat increased serum EPO levels in a dose-dependent manner. Pre-dose EPO levels returned to baseline levels prior to subsequent daily dose. In these studies, vadadustat stimulated endogenous EPO production while avoiding supraphysiologic EPO levels.
- *Vadadustat significantly increased and maintained hemoglobin levels.* Our Phase 2 studies in CKD subjects with anemia demonstrated that vadadustat significantly increased and/or maintained hemoglobin levels. In addition and more recently, our partner, MTPC's, Phase 3 studies in Japanese NDD-CKD and DD-CKD patients with anemia due to CKD further demonstrated the durability of vadadustat with data that showed that vadadustat's effect on hemoglobin was sustained through to 52 weeks comparable to the control arm, darbepoetin alfa.
- *Vadadustat was dosed orally once daily and three times weekly.* Our Phase 2 studies showed that vadadustat can be orally dosed once daily in NDD-CKD subjects with up to 20 weeks of dosing. In addition, our Phase 2 clinical study in DD-CKD subjects demonstrated that in subjects who remained on therapy, once daily oral dosing of vadadustat maintained stable hemoglobin levels in subjects converting from injectable ESA therapy over 16 weeks. This study also showed the potential for three-times weekly dosing of vadadustat in DD-CKD.
- *Vadadustat resulted in favorable changes in iron parameters.* In three Phase 2 clinical studies, treatment with vadadustat was associated with decreases in ferritin and hepcidin and increases in total iron binding capacity. These changes are consistent with improved iron mobilization and utilization for erythropoiesis in NDD-CKD and DD-CKD subjects.

Based on this and other data, we believe vadadustat has the potential to be a treatment for anemia due to CKD with a differentiated safety profile compared with the current standard of care, injectable ESAs, by:

- stimulating erythropoiesis and avoiding supraphysiologic EPO levels;
- increasing hemoglobin in a predictable and controlled manner; and
- minimizing hemoglobin excursions and cycling.

Based upon these key characteristics, we believe vadadustat has the potential to possibly reduce the risk of cardiovascular and thrombotic events associated with injectable ESAs. The efficacy of vadadustat in raising/maintaining hemoglobin levels within a target range, and the cardiovascular safety of vadadustat as compared with darbepoetin alfa, an injectable ESA, is being assessed in our global Phase 3 clinical program for vadadustat.

Vadadustat Clinical Development Program

We believe vadadustat has the potential to address limitations of injectable ESAs and set a new oral standard of care for the treatment of anemia due to CKD, subject to regulatory approval. We are conducting a global Phase 3 clinical development program for vadadustat, and our collaboration partner, MTPC, recently completed its Phase 3 clinical development program for vadadustat in Japan and submitted a JNDA in the third quarter of 2019 for vadadustat for the treatment of anemia due to CKD. We expect top line data from our global Phase 3 programs, INNO₂VATE and PRO₂TECT, to read out in the second quarter of 2020 and mid-2020, respectively. If the trial results are positive, we believe these studies will support filings for regulatory approval in the United States and other regions.

Vadadustat Global Phase 3 Clinical Program

We are conducting a global Phase 3 clinical development program for vadadustat which includes two separate programs called INNO₂VATE and PRO₂TECT. INNO₂VATE studies vadadustat in DD-CKD patients with anemia due to CKD in two separate studies and PRO₂TECT studies vadadustat in NDD-CKD patients with anemia due to CKD in two separate studies. Combined, we enrolled approximately 7,500 patients in these studies and are evaluating once daily oral dosing of vadadustat against an injectable ESA active comparator, darbepoetin alfa.

In August 2016, the first patient was dosed in INNO₂VATE. We completed enrollment in the larger of the two INNO₂VATE studies, which enrolled 3,554 patients, in February 2019, and we completed enrollment in the smaller INNO₂VATE study, which enrolled 369 patients, in April 2019. We anticipate reporting top-line data for the INNO₂VATE studies in the second quarter of 2020.

The first patient was dosed in PRO₂TECT in December 2015. We completed enrollment of PRO₂TECT correction and conversion studies, which enrolled 1,761 and 1,752 patients, respectively, in August 2019. We anticipate reporting top-line data for the PRO₂TECT studies in mid-2020.

In both the PRO₂TECT and INNO₂VATE Phase 3 programs, the primary efficacy endpoint of each program is the mean change in hemoglobin between baseline and the primary evaluation period. Non-inferiority, or NI, is achieved if the lower bound of the 95% confidence interval for the between-group difference of the mean hemoglobin change does not fall below the pre-specified NI margin. Both the PRO₂TECT and INNO₂VATE programs include the primary safety endpoint of the assessment of major adverse cardiovascular events, or MACE, with a comparison of vadadustat to darbepoetin alfa. MACE is defined as the composite endpoint of all-cause mortality, non-fatal myocardial infarction, or non-fatal stroke. The primary analysis for each program is based on the combined MACE events from the two Phase 3 studies in each program (PRO₂TECT and INNO₂VATE). NI is achieved if the upper bound of the 95% confidence interval for the hazard ratio of vadadustat to darbepoetin alfa does not exceed the pre-specified NI margin. We have prospectively defined and agreed to non-inferiority margins with the United States and European regulatory authorities and have agreed with the United States regulatory authorities on the key components of our statistical analysis plan.

In addition to our Phase 3 clinical development program, we are conducting a Phase 2 clinical study of vadadustat, FO₂RWARD-2, evaluating a modified approach to once-daily and three-times weekly dosing, including assessment of a vadadustat starting dose based on an individual's pre-conversion ESA dose prior to study entry and higher titration doses of vadadustat (750 mg and 900 mg). We believe data from this and other studies could support registration of the modified approach to once daily dosing and supplemental registration of three times weekly dosing, and further strengthen our potential commercial position if vadadustat is approved for marketing.

We completed a series of clinical drug-drug interaction studies largely focusing on transporter pathways evaluating vadadustat as a victim (using probe inhibitors) or perpetrator (using probe substrates) of drug interactions. No meaningful drug interactions were observed with atorvastatin (P-gp/OATP1B1 substrate), pravastatin (OATP1B1/1B3 substrate), digoxin (P-gp substrate), furosemide (OAT1/OAT3 substrate), adefovir (OAT1 substrate), cyclosporine (P-gp/BCRP/OATP inhibitor), probenecid (OAT3 and UGT inhibitor), or rabeprazole (gastric acid-reducing agent). With concomitant administration of vadadustat, a mild-to-moderate interaction was observed with simvastatin (OATP1B1/B3 substrate), and moderate drug interactions were observed with rosuvastatin (BCRP/OATP1B1/1B3 substrate), ferrous sulfate, and sulfasalazine (BCRP substrate). In addition, in vitro drug-drug interaction studies demonstrated a very low risk of vadadustat for drug interactions due to alteration of metabolic enzyme activities, i.e. cytochrome P450 or UDP-glucuronosyltransferase isoforms. No clinical drug-interaction was observed with celecoxib (CYP2C9).

MTPC's Phase 3 Clinical Program of Vadadustat in Japan

On March 12, 2019 and November 9, 2019, we announced positive top-line results from two Phase 3 active-controlled pivotal studies evaluating vadadustat in Japanese subjects with anemia due to CKD (J01 and J03 Studies). These studies were conducted by our development and commercialization collaboration partner in Japan, MTPC. Each study, one in NDD-CKD patients and one in DD-CKD patients, met its primary endpoint. In addition, results from two Phase 3 single-arm studies conducted by MTPC in peritoneal dialysis patients and DD-CKD patients (J02 and J04 Studies) further support vadadustat's potential in these indications. MTPC submitted a JNDA in the third quarter of 2019 for vadadustat for the treatment of anemia due to CKD.

The Phase 3 randomized, open-label, active-controlled correction and conversion study (J01 Study) assessed the efficacy and safety of vadadustat compared to darbepoetin alfa in 304 Japanese NDD-CKD patients with anemia, with a treatment duration of 52 weeks. Data from the planned analysis at 24 weeks were announced in March 2019 and showed that the study met its primary endpoint: The difference in mean hemoglobin (Hb) was -0.26 g/dL (95% CI -0.50, -0.02 g/dL), achieving the pre-specified non-inferiority criterion of -0.75 g/dL. The mean Hb level at week 20 and week 24 were 11.66 g/dL (95% CI 11.49, 11.84 g/dL) for vadadustat-treated subjects compared to 11.93 g/dL (95% CI 11.76, 12.10 g/dL) for darbepoetin alfa-treated subjects. The mean Hb level at week 52 was 11.51 g/dL (95% CI 11.35, 11.67 g/dL) for vadadustat-treated subjects compared to 11.58 g/dL (95% CI 11.43, 11.74 g/dL) for darbepoetin alfa-treated subjects. The incidence of adverse events, or AEs, was 90.1% in the vadadustat-treated group compared to 92.2% in the darbepoetin alfa-treated group. The top three most common AEs reported in vadadustat-treated subjects were nasopharyngitis (24.5%), diarrhea (11.9%), and constipation (9.3%). The incidence of serious adverse events, or SAEs, was 27.8% in the vadadustat-treated group compared to 32.0% in the darbepoetin alfa-treated group; no SAE was considered related to study drug. No deaths were reported in the vadadustat-treated group.

The Phase 3 randomized, double-blind, active-controlled conversion study (J03 Study) assessed the efficacy and safety of vadadustat compared to darbepoetin alfa in 323 Japanese DD-CKD patients with anemia who had been receiving ESA therapy prior to study screening, with a treatment duration of 52 weeks. Data from the planned analysis at 24 weeks were announced in March 2019 and showed that the study met its primary endpoint: The difference in mean Hb was -0.05 g/dL (95% CI -0.26, 0.17 g/dL), achieving the pre-specified non-inferiority criterion of -0.75 g/dL. The mean Hb level at week 20 and week 24 at 10.61 g/dL (95% CI 10.45, 10.76 g/dL) for vadadustat-treated subjects compared to 10.65 g/dL (95% CI 10.50, 10.80 g/dL) for darbepoetin alfa-treated subjects. The mean Hb level at week 52 was 10.39 g/dL (95% CI 10.24, 10.54 g/dL) for vadadustat-treated subjects compared to 10.62 g/dL (95% CI 10.48, 10.76 g/dL) for darbepoetin alfa-treated subjects. The incidence of AEs was 95.1% in the vadadustat-treated group compared to 98.1% in the darbepoetin alfa-treated group. The top three most common AEs reported in vadadustat-treated subjects were nasopharyngitis (45.7%), diarrhea (15.4%), and shunt stenosis (14.2%). The incidence of SAEs was 25.3% in the vadadustat-treated group compared to 27.3% in the darbepoetin alfa-treated group; no SAE was considered related to study drug. There were two deaths reported in the vadadustat-treated group and one death in the darbepoetin alfa-treated group and all three were assessed as not related to either vadadustat or darbepoetin alfa.

Vadadustat Phase 1 and Phase 2 Studies

To date, we have completed twenty-four Phase 1 and Phase 2 studies of vadadustat. Findings from three Phase 2 studies demonstrated that vadadustat administered daily raised and/or maintained hemoglobin levels within a target range and improved markers of iron mobilization to support erythropoiesis in CKD patients. The range of doses used in these Phase 2 studies had been previously shown, in Phase 1 studies of healthy volunteers, to stimulate endogenous EPO production while avoiding supraphysiologic EPO levels. The results from one completed Phase 1 and two Phase 2 of these studies are summarized below.

Phase 1 Study in Normal Healthy Volunteers (CI-0002)

We completed a Phase 1 randomized, double-blind, placebo-controlled, multiple-ascending dose study to evaluate the safety, tolerability, pharmacodynamics response, and pharmacokinetics of vadadustat administered for 10 days to healthy male volunteers. Dose responsive increases in reticulocytes, or immature RBCs, and hemoglobin levels were demonstrated in the study. Mean serum EPO levels increased by 36%, 48%, and 89% over baseline, at 8 to 16 hours after dosing in the vadadustat 500 mg/day, 700 mg/day, and 900 mg/day dosing groups, respectively, and returned to baseline by 24 hours after dosing. The incidence of AEs was generally similar between the combined vadadustat dosing groups, which was 76.5%, and the placebo group, which was 78%. Gastrointestinal AEs occurred in 26.5% of subjects in the vadadustat groups and in no subjects on placebo, of which mild to moderate diarrhea was the most frequent AE (24%), with evidence of a dose-related effect. No SAEs or deaths were reported in this study.

Phase 2b Study in Non-Dialysis CKD Subjects (CI-0007)

We completed a multi-center Phase 2b study of vadadustat in NDD-CKD patients with anemia. This double-blind, randomized, placebo-controlled study evaluated the efficacy and safety of vadadustat over 20 weeks of dosing in 210 patients (138 vadadustat and 72 placebo) with CKD Stages 3 to 5. Patients were enrolled into one of three groups: (1) injectable ESA naïve with hemoglobin ≤ 10.5 g/dL, (2) previously treated with injectable ESA with hemoglobin ≤ 10.5 g/dL, or (3) actively treated with injectable ESA with hemoglobin ≥ 9.5 and ≤ 12.0 g/dL, and were randomized at a ratio of 2 to 1 to once daily vadadustat or placebo. The primary endpoint was the percentage of patients with either a mean hemoglobin of ≥ 11.0 g/dL or an increase in hemoglobin by ≥ 1.2 g/dL from baseline. A protocol-defined dose adjustment algorithm was used to achieve the primary endpoint and to minimize hemoglobin excursions ≥ 13 g/dL.

The average age of patients was 66 years; 78% of patients had diabetes mellitus; and the mean estimated GFR was 25 mL/min/1.73m². 54.9% of vadadustat treated patients compared to 10.3% of placebo treated patients met the primary endpoint ($p=0.0001$). Only 4.3% of patients in the vadadustat group had any hemoglobin excursion ≥ 13.0 g/dL. Between Groups 1 and 2 (the two correction cohorts; ESA-naïve and ESA previously treated), mean Hb increased significantly in the vadadustat group from pre-dose average to end-of-study average (Week 19/20). In Group 3 (conversion cohorts; ESA actively treated), placebo treated patients experienced a decline in the mean hemoglobin within the first two weeks, whereas patients randomized to vadadustat maintained a stable hemoglobin throughout the study.

Increases in hemoglobin in the vadadustat group were preceded by an increase in reticulocytes and accompanied by an increase in total iron binding capacity and a decrease in serum hepcidin and ferritin. There was no difference between the vadadustat and placebo groups in vascular endothelial growth factor, or VEGF, levels during the study.

A similar percentage of patients experienced an AE in the vadadustat and placebo treatment groups (vadadustat 74.6% vs. placebo 73.6%); however, the frequency of certain AEs - diarrhea, nausea, hypertension and hyperkalemia - was greater in the vadadustat arm compared to placebo. In the vadadustat arm, a higher number of patients reported SAEs of acute and chronic renal failure compared to placebo (9.4% vs. 2.8%, respectively); however, none was considered drug-related by the investigator. The percentage of patients who had an SAE resulting in dialysis initiation, considered to be a more objective measure of the severity of renal disease, was comparable between vadadustat and placebo groups (8.0% versus 9.7%, respectively) and the number of patients who discontinued from the study due to AEs of worsening CKD requiring dialysis was also comparable between the vadadustat (4.3%) and placebo (5.6%) groups. One subject with multiple co-morbidities and concomitant medications, including chlorthalidone, had an SAE of liver function test, or LFT, abnormal, considered a case of drug-induced liver injury meeting the biochemical criteria of Hy's Law, which was assessed as probably related to vadadustat. This subject made a complete recovery after vadadustat was discontinued. There were three deaths in vadadustat-treated patients of which two cardiovascular deaths were considered to be unrelated to vadadustat and one death was attributed to myocardial ischemic and considered by the investigator to be possibly related to vadadustat; no autopsy was performed. There were no deaths in the placebo group.

In summary, vadadustat achieved the desired outcomes of raising and maintaining hemoglobin and increasing iron mobilization, while minimizing hemoglobin excursions ≥ 13 g/dL. Pergola et al published the results of this study in *Kidney International* 2016.

Phase 2 Study in Dialysis-Dependent CKD Patients (CI-0011)

We completed a multi-center, open-label, 16-week study to assess the hemoglobin response, safety, and tolerability of vadadustat in DD-CKD patients. The study enrolled 94 hemodialysis patients with baseline hemoglobin levels of 9-12 g/dL, who were maintained on injectable ESAs prior to study entry. Patients were converted from injectable ESA to vadadustat, and assigned to one of three dose cohorts: 300 mg once daily; 450 mg once daily; or 450 mg three-times weekly. For each dose cohort, the average hemoglobin level at study entry was compared to the average hemoglobin level at weeks 7 and 8, and to the average hemoglobin level at weeks 15 and 16. To evaluate hemoglobin response to each of the dose regimens, during the first eight weeks of this study, patients were to remain on the prescribed starting dose, or decreased if necessary to control hemoglobin in the target range. Beginning at week 8, the dose of vadadustat could be increased or decreased to maintain hemoglobin levels as needed. Intravenous iron use was allowed.

The underlying demographics and profiles of these CKD patients were well-balanced across the three cohorts, and reflective of the United States DD-CKD population as reported in the literature. Average age was 58 years, with an average time on dialysis of 4.6 years. The most common cause of end-stage renal disease was diabetes mellitus and/or hypertension. Baseline hemoglobin levels were similar at 10.4-10.6 g/dL in all three cohorts and the serum ferritin levels indicated that the patients were iron replete at study entry and throughout the study.

For patients in all three dosing cohorts (converted from ESA) who completed the study, the primary endpoint of maintaining stable mean hemoglobin levels over 16 weeks was achieved. In the sensitivity analysis using last observation carried forward to account for early discontinuations, mean Hb levels remained stable in the 300 mg daily dose cohort and modest declines were observed in the 450 mg daily and 450 mg three-times weekly dose cohorts. Post-hoc analyses indicated that baseline pre-conversion ESA dose was inversely associated with mean change in hemoglobin. Consistent with previous studies, all three starting dose regimens suggested an improvement in iron mobilization, as reflected by increases in total iron binding capacity and serum iron, and decreases in serum ferritin and hepcidin levels. Only one subject in the 300 mg once daily cohort had a single hemoglobin excursion to 13.1 g/dL.

These data support further development of vadadustat daily dosing to assess its long-term safety and efficacy in patients on hemodialysis. These data also support further investigation of three times weekly dosing of vadadustat.

Adverse events were balanced across the three cohorts with 83% of patients with at least one AE. There were no discernible trends in the frequency of AEs or SAEs by dose cohort. The most frequently reported AEs were nausea and diarrhea, 11.7% and 10.6%, respectively, with no apparent dose relationship. The majority of AEs were mild or moderate in severity. SAEs were reported in 13 patients, or 13.8%, including two patients with acute myocardial infarction considered not related to vadadustat by the investigator. No SAEs were reported as related to vadadustat and no deaths occurred during the study. Haase et al published the results of this study in *Nephrology Dialysis Transplantation* 2018.

Commercialization

We are in the process of preparing for a potential commercial launch of vadadustat in Japan, the United States and certain other markets. Our ability to launch vadadustat in the United States is dependent on the successful outcome of our global Phase 3 program, the successful filing and defense of an NDA, and approval by the FDA and other regulatory authorities.

We plan to commercialize vadadustat, subject to FDA approval, in the United States with our well-established, nephrology-focused commercial organization, while leveraging our collaboration with Otsuka and its U.S. nephrology commercial organization. We also granted Otsuka exclusive rights to commercialize vadadustat in Europe, China and certain other markets, subject to marketing approvals. In Japan and certain other countries in Asia, we granted MTPC exclusive rights to commercialize vadadustat, subject to marketing approvals. In addition, we granted Vifor Pharma an exclusive license to sell vadadustat to FKC and Third Party Dialysis Organizations, which combined manage up to approximately 60% of the dialysis patients in the United States, which would be effective upon FDA approval of vadadustat, vadadustat's reimbursement under a bundled reimbursement model or that vadadustat will be reimbursed using the TDAPA, and a milestone payment by Vifor Pharma. During the term of the license agreement, Vifor Pharma is not permitted to sell any HIF product that competes with vadadustat in the United States to FKC or its affiliates or to any Third Party Dialysis Organization, and we may not directly supply vadadustat to FKC or any other affiliate of FMCNA or any Third Party Dialysis Organization. For more information about our license, collaboration and strategic agreements relating to vadadustat, see Part I, Item 1. Business – License, Collaboration and Other Strategic Agreements – Vadadustat.

Our Commercial Product: Auryxia

Overview

Auryxia (ferric citrate) is a non-calcium, non-chewable, orally-administered tablet that was approved for marketing by the FDA in September 2014 as a phosphate binder for the Hyperphosphatemia Indication and was commercially launched in the United States shortly thereafter. In November 2017, Auryxia received marketing approval from the FDA for a second indication, the IDA Indication, and was commercially launched for this indication in the United States shortly thereafter.

In January 2014, our Japanese sublicensee, JT, received approval from the Japanese Ministry of Health, Labour and Welfare to market ferric citrate hydrate in Japan under the trade name Riona as an oral treatment for the improvement of hyperphosphatemia in patients with CKD, including DD-CKD and NDD-CKD, and was commercially launched in Japan shortly thereafter. In July 2019, JT, and its subsidiary, Torii, reported positive top-line results from a pivotal Phase 3 comparative study evaluating Riona for the treatment of IDA in adult patients in Japan. Upon successful completion of its Phase 3 program, JT and Torii stated that they expect to file an application for approval of IDA as an additional indication for Riona in Japan.

In September 2015, we received approval to market ferric citrate in the European Union under the tradename Fexeric. Pursuant to the sunset clause under EU law, the European Commission's approval of Fexeric in the EU was contingent on, among other things, our commencing marketing of Fexeric within three years; although we successfully negotiated an extension to December 23, 2019, we did not commence marketing Fexeric by such date and therefore the Fexeric approval in the EU has ceased to be valid.

We have licensed and sublicensed certain intellectual property rights covering Auryxia from Panion & BF Biotech, Inc., or Panion. For more information regarding our intellectual property rights to Auryxia and our license agreement with Panion see Part I, Item 1. Business – Intellectual Property – Auryxia and Part I, Item 1. Business - License, Collaboration and Other Strategic Agreements – License Agreement with Panion & BF Biotech, Inc. We have received Paragraph IV certification notice letters regarding Abbreviated New Drug Applications, or ANDAs, submitted to the FDA requesting approval for generic versions of Auryxia tablets (210 mg iron per tablet), with the first having been received on October 31, 2018. We have filed certain complaints for patent infringement relating to such ANDAs, and have entered into a settlement and license agreement with one such ANDA filer. See Part I, Item 3. Legal Proceedings for further information relating to the ANDAs, lawsuits and settlement.

Market Opportunity

Hyperphosphatemia

Hyperphosphatemia is a metabolic disorder characterized by elevated serum phosphorus levels. Phosphorus is a vital element required for most cellular processes and, in individuals with normal kidney function, excess dietary phosphorus is removed by the kidneys and excreted in urine. In adults with functioning kidneys, normal serum phosphorus levels are 2.5 to 4.5 mg/dL. In adults with DD-CKD, elevated phosphorus levels, or hyperphosphatemia, can be associated with adverse effects, including increased risk for cardiovascular disease, bone disease and death.

Phosphate binders are the only interventions marketed for the treatment of hyperphosphatemia. According to the USRDS 2019 Annual Data Report, there are approximately 524,000 adult patients in the United States with DD-CKD in 2017, of which approximately 87% were treated with a phosphate binder. Phosphate binders need to be taken with meals and snacks, and it is not uncommon for DD-CKD patients to be prescribed as many as 12 or more phosphate binder pills per day, among other medications. Patients taking phosphate binders also experience gastrointestinal tolerability issues. As a result of the pill burden and tolerability issues associated phosphate binders, prescribed phosphate binders are often intolerable for many patients, leading to lack of treatment adherence and compliance.

In addition, in 2017 approximately 35% of patients treated with a phosphate binder were treated solely with a calcium-based binder, which can lead to side effects such as increased cardiovascular risk, hypercalcemia and gastrointestinal-related adverse events. Due to the risks associated with calcium-based binders, in 2017 *Kidney Disease: Improving Global Outcomes*, or KDIGO, recommended that clinicians limit the use of calcium-based binders.

Sevelamer and lanthanum-based phosphate binders are other alternatives. Lanthanum is a rare earth element and is minimally absorbed in the gastrointestinal tract. Lower level tissue deposition, particularly in bone and liver, has been observed in animals, however, the long-term, potentially harmful, effects due to the accumulation of lanthanum in these tissues have not been clearly determined.

Aluminum-type phosphate binders were widely used in the past. However, the systemic absorption of aluminum from these agents and the potential toxicity associated with their use no longer make this type of binder a viable long-term treatment option.

Iron Deficiency Anemia

Anemia is a condition characterized by abnormally low levels of hemoglobin. Hemoglobin is contained within RBCs and carries oxygen to other parts of the body. If there are too few RBCs or if hemoglobin levels are low, the cells in the body will not get enough oxygen. IDA is a common form of anemia that is caused by patients not having enough iron to manufacture healthy RBCs. Although anyone can develop IDA, IDA is particularly common in patients with NDD-CKD. IDA is associated with fatigue, lethargy, decrease quality of life, cardiovascular complications, hospitalizations and increased mortality.

We estimate that there are more than 500,000 adult patients in the United States with NDD-CKD diagnosed with IDA. Currently, there are two forms of iron therapy used to treat IDA: oral iron supplements and iron delivered via intravenous infusion, or IV iron. Oral iron is currently the first-line iron replacement therapy for most physicians; however, oral iron supplements are poorly absorbed by many patients, which may adversely impact their effectiveness, and are associated with certain side effects, such as constipation, diarrhea and cramping, that may adversely affect patient compliance. IV iron is viewed as an effective treatment; however, like other intravenous medicines, it is logistically difficult to administer in an office setting, where NDD-CKD patients are more often treated.

Commercialization

We market Auryxia in the United States through our well-established, nephrology-focused sales force and commercial organization.

Auryxia, as an oral drug, is covered by Medicare only under Part D. We have gained broad access for Auryxia in the United States in both Medicare Part D and commercial channels. Auryxia is currently covered for the Hyperphosphatemia Indication in nine of the ten largest Medicare Part D plans, which provide coverage for approximately 35.8 million people, and the ten largest commercial plans and pharmacy benefit managers in the United States, which provide coverage for approximately 131.0 million people. In September 2018, the Centers for Medicare & Medicaid Services, or CMS, decided that Auryxia would not be covered by Medicare for the IDA Indication. While this decision does not impact CMS coverage of the Hyperphosphatemia Indication, it requires all Auryxia prescriptions for Medicare patients to undergo a prior authorization to ensure their use in the Hyperphosphatemia Indication. On October 15, 2019, we filed a complaint in the United States District Court for the District of Massachusetts against CMS and the U.S. Department of Health and Human Services challenging CMS's decision that Auryxia would no longer be covered by Medicare for the IDA Indication and CMS's related decision that imposed a prior authorization requirement for Auryxia in the Hyperphosphatemia Indication. See Part I, Item 3. Legal Proceedings for further information.

JT, and its subsidiary, Torii, market Riona in Japan. We receive tiered double-digit royalties from JT and Torii based on their sales in Japan.

Manufacturing and Supply

Overview

We neither own nor operate, and currently have no plans to own or operate, any manufacturing or distribution facilities. We currently rely on third-party contract manufacturing organizations, or CMOs, to produce all of our preclinical and clinical material and commercial supply and third-party distributors to distribute Auryxia. We expect to continue to rely on either existing or alternative distributors and CMOs to distribute our products and supply our ongoing and planned preclinical and clinical studies and for commercial production.

We have established relationships with several CMOs under which the CMOs manufacture preclinical and clinical supplies of vadadustat drug substance and drug product and clinical and commercial supply of Auryxia drug substance and drug product. All clinical and commercial supplies are manufactured under current Good Manufacturing Practices, or cGMPs, which is a regulatory standard for the production of pharmaceuticals that will be used in humans.

Vadadustat

We currently have redundant supply arrangements in place for the preclinical and clinical supply of vadadustat. We have entered into supply agreements with Esteve Química, S.A. and Patheon Inc. for the manufacture of vadadustat drug substance and drug product, respectively, for commercial use. We intend to put additional supply arrangements in place for commercial manufacturing of vadadustat. We plan to mitigate potential commercial supply risks for vadadustat, if any, through inventory management and redundant manufacturing arrangements for both drug substance and drug product; however, the timing of such arrangements is uncertain and may occur following the launch of vadadustat, if approved.

Vadadustat is a small molecule. The synthesis of vadadustat is reliable and reproducible from starting materials available from multiple sources at commercially relevant scale using no unusual manufacturing equipment. Vadadustat can be formulated into compressed tablets using proprietary processes. As with any supply program, obtaining raw materials and finished drug product of the required quality and quantity cannot be guaranteed and we cannot ensure that we will be successful in this endeavor.

Auryxia

We have established CMO relationships for the supply of Auryxia to help ensure that we will have sufficient material for ongoing commercial sales and clinical trials. The drug substance for Auryxia is supplied by Siegfried Evionnaz SA (two sites) and BioVectra Inc. (one site), pursuant to supply agreements with pricing structured on a per-kilogram basis. Auryxia drug product is supplied by Patheon Manufacturing Services LLC (Thermo Fisher) (three sites) pursuant to a Master Manufacturing Service Agreement with per-bottle pricing structured on a tiered basis, with the price reduced as the product volume increases. These agreements require that we satisfy certain minimum purchase requirements, but we are not obligated to use them as our sole suppliers. For more information about our manufacturing agreements for Auryxia, see Part II, Item 7. Management's Discussion and Analysis and Note 16 to our consolidated financial statements in Part II, Item 8. Financial Statements and Supplementary Data.

Our CMOs have other clients and may have other priorities that could affect their ability to perform the work satisfactorily and/or on a timely basis. Both of these occurrences would be beyond our control.

The active pharmaceutical ingredient of Auryxia, ferric citrate, is a small molecule. The synthesis of ferric citrate is reliable and reproducible from starting materials available from multiple sources at commercially relevant scale. Ferric citrate can be formulated into compressed tablets using proprietary manufacturing processes. As with any supply program, obtaining raw materials and finished drug product of the required quality and quantity cannot be guaranteed, and we cannot ensure that we will be successful in this endeavor.

We utilize third parties for the commercial distribution of Auryxia, including wholesale distributors and certain specialty pharmacy providers. We have also engaged Cardinal Health as the exclusive third-party logistics distribution agent for commercial sales of Auryxia.

License, Collaboration and Other Strategic Agreements

Vadadustat

U.S. Collaboration with Otsuka Pharmaceutical Co. Ltd.

On December 18, 2016, we entered into a collaboration and license agreement with Otsuka, or the Otsuka U.S. Agreement, pursuant to which we agreed to co-exclusively collaborate with Otsuka with respect to the development and commercialization of vadadustat in the United States, subject to the approval of vadadustat by the FDA. We continue to lead the ongoing global Phase 3 development program for vadadustat. We and Otsuka will co-commercialize vadadustat in the United States, subject to the approval of vadadustat by the FDA.

Under the terms of the Otsuka U.S. Agreement, Otsuka paid us an upfront payment of \$125.0 million and we expect Otsuka to provide additional funding of \$266.8 million or more, depending on the actual costs incurred, toward the vadadustat global Phase 3 development program. Due to the costs incurred in completing the activities under the current global development plan exceeding a certain threshold in the second quarter of 2019, we elected to require Otsuka to increase the aggregate percentage of current global development costs it funds under the Otsuka U.S. Agreement and the Otsuka International Agreement, as defined below, from 52.5% to 80%, or the Otsuka Funding Option. The additional funding expected to result from having exercised the Otsuka Funding Option, or the Additional Funding, is fully creditable against future payments due to us under the arrangement, provided that future payments due to us may not be reduced by more than 50% in any calendar year and any remaining creditable amount above 50% in any calendar year will be applied to subsequent future payments until fully credited. We are eligible to receive from Otsuka up to \$190.0 million in development and regulatory milestones and up to \$575.0 million in specified commercial milestones.

The Otsuka U.S. Agreement establishes a profit share for the commercialization of vadadustat in the United States. The parties will equally share all net sales of vadadustat in the United States, if approved, and generally each party will bear half of all costs in the United States, including medical affairs, commercialization and manufacturing costs.

Under the Otsuka U.S. Agreement, we and Otsuka will jointly conduct, and will have equal responsibility for, all medical affairs and commercialization activities pursuant to plans agreed by the parties. We will remain responsible for manufacturing vadadustat. Additionally, the parties agreed not to promote, market or sell any competing product in the territory covered by the agreement.

International Collaboration with Otsuka Pharmaceutical Co. Ltd.

On April 25, 2017, we entered into a collaboration and license agreement with Otsuka, or the Otsuka International Agreement, pursuant to which we granted Otsuka an exclusive license for the development and commercialization of vadadustat in certain territory outside the United States. The territory covered by the Otsuka International Agreement includes the European Union, Russia, China, Australia, Canada, the Middle East and certain other countries, or the Otsuka International Territory, but excludes Latin America and previously licensed jurisdictions. Under the Otsuka International Agreement, Otsuka is responsible for certain development activities and commercializing vadadustat in the Otsuka International Territory, while we lead the ongoing global Phase 3 development program. Otsuka will fund a significant percentage of the costs of such global development program regardless of the total actual costs ultimately incurred. We and Otsuka have final decision-making authority with respect to certain matters. Additionally, the parties agreed not to promote, market or sell any competing product in the territory covered by the agreement.

Under the terms of the Otsuka International Agreement, we expect Otsuka to pay us at least \$287.2 million, comprised of \$73.0 million that was paid upon execution of the Otsuka International Agreement and \$214.2 million or more, depending on actual costs incurred, of development funding. In addition, we are eligible to receive from Otsuka up to \$132.0 million in development and regulatory milestones and up to \$525.0 million in commercial milestones. Otsuka also agreed to make tiered, escalating royalty payments ranging from low double digits up to thirty percent of net sales of vadadustat within the Otsuka International Territory. In limited circumstances, upper tier royalties may be subject to reduction if the supply price charged by us to Otsuka for vadadustat exceeds certain agreed upon thresholds, and royalty payments may also be reduced if a generic product is launched, on a country-by-country basis. Otsuka may elect to conduct additional studies of vadadustat in the European Union, subject to our right to delay such studies based on our objectives outside the Otsuka International Territory. Otsuka will pay a percentage of the costs of any such studies, and we will pay its portion of the costs in the form of a credit against future amounts due to us under the Otsuka International Agreement.

Collaboration with Mitsubishi Tanabe Pharma Corporation

On December 11, 2015, we entered into a collaboration agreement with MTPC, or the MTPC Agreement, providing MTPC with exclusive development and commercialization rights to vadadustat in Japan and certain other Asian countries, or the MTPC Territory. In addition, we will supply vadadustat for both clinical and commercial use in the MTPC Territory, subject to MTPC's option to manufacture commercial drug product in the MTPC Territory. We plan to enter into a supply agreement with MTPC for the commercial supply of vadadustat prior to commercial launch.

We and MTPC agreed that, instead of including Japanese patients in our global Phase 3 program for vadadustat, MTPC would be the sponsor of a Phase 3 program for vadadustat in Japan. MTPC reported top-line data for the two Phase 3 pivotal trials and data from the two supportive Phase 3 studies in March 2019 and 52-week data for the two Phase 3 pivotal trials in November 2019. In July 2019, MTPC submitted a Japanese New Drug Application, or JNDA, to the Ministry of Health, Labor and Welfare in Japan for manufacturing and marketing approval of vadadustat, as a treatment for anemia due to CKD.

Under the terms of the MTPC Agreement, MTPC will make payments to us of up to \$245.0 million in the aggregate based on the achievement of certain development, regulatory and sales milestones, as well as tiered double-digit royalty payments of up to 20% on sales of vadadustat in the MTPC Territory, subject to reduction upon launch of a generic product on a country-by-country basis. MTPC is responsible for the costs of the Phase 3 program for vadadustat in Japan and will make no additional funding payments for our global Phase 3 program for vadadustat. Additionally, the development costs of approximately \$20.5 million for our Phase 2 studies in Japan were reimbursed to us by MTPC.

In addition, in September 2017 we agreed to provide MTPC with an option to use data from our global Phase 3 vadadustat program to obtain regulatory approval for vadadustat in Japan. If exercised, MTPC would make payments to us of up to \$25.0 million.

Vifor Pharma License Agreement

On May 12, 2017, we entered into a License Agreement with Vifor Pharma, or the Vifor Agreement. On April 8, 2019, we entered into an Amended and Restated License Agreement with Vifor Pharma, or the Vifor Amended Agreement, which amends and restates in full the Vifor Agreement, pursuant to which we granted Vifor Pharma an exclusive license to sell vadadustat to FKC, an affiliate of Fresenius Medical Care North America, and to Third Party Dialysis Organizations, in the United States, which would be effective upon the approval of vadadustat for DD-CKD patients by the FDA, inclusion of vadadustat in a bundled reimbursement model or that vadadustat will be reimbursed using the TDAPA, and payment by Vifor Pharma of a \$25 million milestone upon the occurrence of these two events. The Vifor Agreement is structured as a profit share arrangement between us and Vifor Pharma in which we will receive a majority of the profit from Vifor Pharma's sales of vadadustat to FKC and to Third Party Dialysis Organizations in the United States. We will share the milestone payment and the revenue from the profit share with Otsuka pursuant to the Otsuka U.S. Agreement. We retain all rights to commercialize vadadustat for use in the NDD-CKD market and in other dialysis organizations in the United States, which will be done in collaboration with Otsuka if vadadustat is approved by the FDA.

Prior and subject to FDA approval of vadadustat, we and Vifor Pharma plan to enter into a commercial supply agreement for vadadustat pursuant to which we would supply all of Vifor Pharma's commercial requirements for vadadustat in the United States. In addition, pursuant to the Vifor Agreement, Vifor Pharma will enter into supply agreements that govern the terms pursuant to which Vifor Pharma would supply vadadustat to FKC and Third Party Dialysis Organizations for use in patients at its dialysis centers, subject to FDA approval; however, FKC and the Third Party Dialysis Organizations are not obligated to utilize vadadustat in its clinics. During the term of the Vifor Agreement, Vifor Pharma will not sell to FKC, its affiliates, or Third Party Dialysis Organizations any HIF product that competes with vadadustat in the United States, and we may not directly supply vadadustat to FKC or any other affiliate of FMCNA or any Third Party Dialysis Organization.

Janssen Pharmaceutica NV Research and License Agreement

On February 9, 2017, we entered into a Research and License Agreement, the Janssen Agreement, pursuant to which Janssen granted us an exclusive license under certain intellectual property rights to develop and commercialize worldwide certain HIF-PH-targeted compounds.

Under the terms of the Janssen Agreement, Janssen granted us a license for a three-year research term to conduct research on Janssen's HIF compound portfolio, which research term is now expired. During the research term, we could designate one or more compounds as candidates for development and commercialization. Once a compound was designated for development and commercialization, we were to be solely responsible for the development and commercialization of the compound worldwide at our own cost and expense.

Under the terms of the Janssen Agreement, we paid an upfront payment of \$1.0 million in cash to Janssen and issued a warrant to purchase 509,611 shares of our common stock, the fair value of which was approximately \$3.4 million. In addition, Janssen could be eligible to receive up to an aggregate of \$16.5 million from us in specified development milestone payments on a product-by-product basis. Janssen will also be eligible to receive up to \$215.0 million from us in specified commercial milestones as well as tiered, escalating royalties ranging from a low to mid-single digit percentage of net sales, on a product-by-product basis and subject to reduction upon expiration of patent rights or the launch of a generic product in the territory.

Janssen also has a right of first offer to engage in exclusive negotiations with us to develop and commercialize certain products developed by us containing compounds for the treatment of inflammatory bowel disease.

Auryxia

License Agreement with Panion & BF Biotech, Inc.

Prior to the Merger, Keryx entered into a license agreement, or the Panion License Agreement, which was amended from time to time, with Panion & BF Biotech, Inc., or Panion, under which Keryx in-licensed the exclusive worldwide rights, excluding certain Asian-Pacific countries, or the Licensor Territory, for the development and commercialization of ferric citrate.

On April 17, 2019, we and Panion entered into a second amended and restated license agreement, or the Panion Amended License Agreement, which amends and restates in full the Panion License Agreement, effective as of April 17, 2019. The Panion Amended License Agreement provides Keryx with an exclusive license under Panion-owned know-how and patents covering the rights to sublicense, develop, make, use, sell, offer for sale, import and export ferric citrate worldwide, excluding the Licensor Territory. The Panion Amended License Agreement also provides Panion with an exclusive license under Keryx-owned patents covering the rights to sublicense (with our written consent), develop, make, use, sell, offer for sale, import and export ferric citrate in certain countries in the Licensor Territory. Consistent with the Panion License Agreement, under the Panion Amended License Agreement, Panion is eligible to receive from us or any sublicensee royalty payments based on a mid-single digit percentage of sales of ferric citrate in our licensed territories. We are eligible to receive from Panion or any sublicensee royalty payments based on a mid-single digit percentage of net sales of ferric citrate in Panion's licensed territories.

The Panion Amended License Agreement terminates upon the expiration of each of our and Panion's obligations to pay royalties thereunder. In addition, we may terminate the Panion Amended License Agreement (i) in its entirety or (ii) with respect to one or more countries in our licensed territory, in either case upon 90 days' notice. We and Panion also each have the right to terminate the Panion Amended License Agreement upon the occurrence of a material breach of the Panion Amended License Agreement by the other party, subject to certain cure provisions, or certain insolvency events. The Panion Amended License Agreement also provides that, on a country-by-country basis, until the second anniversary of the expiration of our or Panion's obligation, as applicable, to pay royalties in a country in which such party has ferric citrate for sale on the date of such expiration, neither the other party nor its affiliates will, directly or indirectly, sell, distribute or otherwise commercialize or supply or cause to supply ferric citrate to a third party for sale or distribution in such country. In addition, the Panion Amended License Agreement provides that each of us and Panion has the right, but not the obligation, to conduct litigation against any infringer of certain patent rights under the Panion Amended License Agreement in certain territories.

During the year-ended December 31, 2019, Panion earned \$10.2 million in royalty payments relating to the sales of Auryxia in the United States and JT and Torii net sales of Riona in Japan, as we are required to pay a low double-digit percent of sublicense income to Panion under the terms of the license agreement, excluding any income under the JT and Torii sublicense.

Sublicense Agreement with Japan Tobacco Inc. and Torii Pharmaceutical Co., Ltd.

In September 2007, Keryx entered into a Sublicense Agreement with JT and Torii, under which JT and Torii obtained the exclusive sublicense rights for the development and commercialization of ferric citrate in Japan. Effective June 8, 2009, Keryx entered into an Amended and Restated Sublicense Agreement, which was amended in June 2013, or the Revised Agreement, with JT and Torii.

In January 2014, JT and Torii received manufacturing and marketing approval of ferric citrate from the Japanese Ministry of Health, Labour and Welfare. Ferric citrate, which launched in May 2014 and is being marketed in Japan by Torii under the brand name Riona, is indicated as an oral treatment for the improvement of hyperphosphatemia in patients with CKD, including NDD-CKD and DD-CKD. JT and Torii are currently conducting a Phase 3 clinical program evaluating Riona for the treatment of IDA in adult patients in Japan. JT and Torii have stated that, upon successful completion of its Phase 3 program, they expect to file an application for approval of IDA as an additional indication for Riona in Japan. Under the terms of the Revised Agreement with JT and Torii, we are eligible to receive royalty payments based on a tiered double-digit percentage of net sales of Riona in Japan escalating up to the mid-teens, subject to certain reductions upon expiration or termination of the Panion Amended License Agreement, and may also receive up to an additional \$55.0 million upon the achievement of certain annual net sales milestones. In accordance with our revenue recognition policy, royalty revenues are recognized in the quarter that JT and Torii provide their written report and related information to us regarding sales of Riona, which generally will be one quarter following the quarter in which the underlying sales by JT and Torii occurred. We recorded \$5.9 million in license revenue related to royalties earned on net sales of Riona in Japan during the twelve months ended December 31, 2019. We record the associated mid-single digit percentage of net sales royalty expense due to Panion, the licensor of ferric citrate, in the same period as the royalty revenue from JT and Torii is recorded.

The sublicense under the Revised Agreement terminates upon the expiration of all underlying patent rights. Also, JT and Torii may terminate the Revised Agreement with or without cause upon at least six months prior written notice to us. Additionally, either party may terminate the Revised Agreement for cause upon 60 days' prior written notice after the breach of any uncured material provision of the Revised Agreement, or after certain insolvency events.

Intellectual Property

The proprietary nature of, and protection for, our products, product candidates and our discovery programs, processes and know-how are important to our business. Our policy is to seek to protect our proprietary position by, among other methods, filing patent applications related to our proprietary technology, inventions and improvements that are important to the development and implementation of our business. We also rely on know-how, continuing technological innovation and potential in-licensing opportunities to develop and maintain our proprietary position. Additionally, we may benefit from a variety of statutory frameworks in the United States, Europe and other countries that provide periods of non-patent-based exclusivity for qualifying molecules. See “—Regulatory Matters.”

Our commercial success will depend in part on obtaining and maintaining patent protection of our current products as well as current and future product candidates, methods of their use and the methods used to develop and manufacture them, as well as successfully defending these patents against third-party challenges. Our ability to stop third parties from making, using, selling, offering to sell or importing our products depends on the extent to which we have rights under valid and enforceable patents that cover these activities. We cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications filed by us in the future, nor can we be sure that any of our existing patents or any patents that may be granted to us in the future will be commercially useful in protecting our product candidates, discovery programs and processes. Even once patents successfully issue, third parties may challenge the validity, enforceability, inventorship, or scope thereof, which may result in such patents being narrowed, invalidated or held not infringed or unenforceable. For this and more comprehensive risks related to our intellectual property, please see “Risk Factors—Risks Related to Our Intellectual Property.”

Individual patents extend for varying periods of time depending on the date of filing of the patent application or the date of patent issuance and the legal term of patents in the countries in which they are obtained. Generally, patents issued from applications filed in the United States are effective for 20 years from the earliest filing date of a United States non-provisional application or an international application filed under the Patent Cooperation Treaty. In addition, in certain instances, a patent term can be extended to recapture a portion of the term effectively lost as a result of the FDA regulatory review period, however, the restoration period cannot be longer than five years and the total patent term including the restoration period must not exceed 14 years following FDA approval. The duration of foreign patents varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest international filing date. Patent term recapture for loss of term as a result of the regulatory review period is available in some foreign jurisdictions. In the United States, a patent's term may also be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the United States Patent and Trademark Office, or USPTO, in granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier-filed patent.

Changes in either the patent laws or interpretations of patent laws in the United States and other countries can diminish our ability to protect our inventions and enforce our intellectual property rights. Accordingly, we cannot predict the breadth or enforceability of claims that may be granted in our patents or in third-party patents. The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. Our ability to maintain and solidify our proprietary position for our drugs and technology will depend on our success in obtaining effective claims and enforcing those claims once granted. We do not know whether any of the patent applications that we may file or license from third parties will result in the issuance of any patents. The issued patents that we own or license or may receive or acquire in the future may be challenged, invalidated or circumvented, and the rights granted under any issued patents may not provide us with sufficient protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may be able to independently develop and commercialize similar drugs or duplicate our technology, business model or strategy without infringing our patents. Because of the extensive time required for clinical development and regulatory review of a drug we may develop, it is possible that, before any of our drugs can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby reducing any advantage of any such patent. The patent positions for Auryxia and vadadustat are summarized below.

Vadadustat Patent Portfolio

We hold 11 issued patents covering the composition of matter, polymorph, method of treating anemia, and pharmaceutical compositions of vadadustat in the United States and additional patents issued or pending in many other major jurisdictions worldwide, including Europe, Japan, China, South Korea, Brazil, Mexico, Russia, Israel and India. The expected expiration dates for these patents are between 2027 and 2034 plus any extensions or adjustments of term available under national law.

We also hold patents and patent applications directed to processes for manufacturing vadadustat, dosing regimens, formulations, and various other aspects relating to the treatment of anemia using vadadustat that are expected to expire between 2032 and 2040 exclusive of possible patent term extensions or adjustments.

We have ongoing opposition and invalidity proceedings relating to vadadustat. See Part II, Item 3. Legal Proceedings for further information relating to these matters.

Auryxia Patent Portfolio

Pursuant to Keryx's license with Panion & BF Biotech, Inc., or Panion, we have the exclusive rights under a series of patents and patent applications to commercialize Auryxia worldwide, excluding certain Asian-Pacific countries. These patents and patent applications include claims directed to compositions of matter, pharmaceutical compositions, methods of treatment, as well as methods for the manufacture of Auryxia.

Keryx's patent rights include 15 issued U.S. patents listed in the Orange Book covering the composition of matter, method of treating hyperphosphatemia, and pharmaceutical compositions of Auryxia. The expected expiration dates for these patents are between 2020 and 2030 plus any additional patent term extensions that may be available.

Pursuant to the sublicense with our Japanese partner, Japan Tobacco Inc., or JT, and its subsidiary, Torii Pharmaceutical Co. Ltd., or Torii, we have exclusively sublicensed certain Japanese patent rights to JT and Torii. These sublicensed rights include several Japanese patents and pending patent applications with composition of matter claims and methods of use claims covering Riona, the trade name under which JT and Torii market ferric citrate in Japan. The expected expiration dates for these patents and pending patent applications are between 2022 and 2027. To date, to our knowledge, no contested proceedings or third-party claims have been lodged against any of these Japanese patents.

We have received Paragraph IV certification notice letters regarding ANDAs submitted to the FDA requesting approval for generic versions of Auryxia tablets (210 mg iron per tablet), have filed certain complaints for patent infringement relating to such ANDAs, and have entered into a settlement and license agreement with one such ANDA filer. We also have an ongoing appeal regarding an opposition proceeding against a European patent covering Auryxia. See Part II, Item 3. Legal Proceedings for further information relating to these matters.

Other Intellectual Property Rights

We depend upon trademarks, trade secrets, know-how and continuing technological advances to develop and maintain our competitive position. To maintain the confidentiality of trade secrets and proprietary information, we require our employees, scientific advisors, consultants and collaborators, upon commencement of a relationship with us, to execute confidentiality agreements and, in the case of parties other than our research and development collaborators, to agree to assign their inventions to us. These agreements are designed to protect our proprietary information and to grant us ownership of technologies that are developed in connection with their relationship with us. These agreements may not, however, provide protection for our trade secrets in the event of unauthorized disclosure of such information.

In addition to patent protection, we may utilize orphan drug regulations, pediatric exclusivity or other provisions of the Food, Drug and Cosmetic Act of 1938, as amended, or FDCA, such as new chemical entity exclusivity or new formulation exclusivity, to provide market exclusivity for a drug candidate. In the United States, the FDA has the authority to grant additional data protection for approved drugs where the sponsor conducts specified testing in pediatric or adolescent populations. If granted, this pediatric exclusivity may provide an additional six months which are added to the term of data protection as well as to the term of a relevant patent, to the extent these protections have not already expired. We may also seek to utilize market exclusivities in other territories. We cannot assure that our drug products or any drug candidates we may acquire or in-license, will obtain such orphan drug designation, pediatric exclusivity, new chemical entity exclusivity or any other market exclusivity in the United States, European Union or any other territory, or that we will be the first to receive the respective regulatory approval for such drugs so as to be eligible for any market exclusivity protection.

Know-How

In addition to patents, we rely upon unpatented know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary information, in part, using confidentiality agreements with our collaborators, employees and consultants and invention assignment provisions in the confidentiality agreements with our employees. These agreements are designed to protect our proprietary information and, in the case of the invention assignment provisions, to grant us ownership of technologies that are developed by our employees. These agreements may be breached, and we may not have adequate remedies for any breach.

To the extent that our commercial partners, collaborators, employees and consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

The Hatch-Waxman Act

Orange Book Listing

In seeking approval for a drug through an NDA, applicants are required to list with the FDA each patent whose claims cover the applicant's product. Upon approval of a drug, each of the patents listed in the application for the drug is then published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book. Drugs listed in the Orange Book can, in turn, be cited by potential generic competitors in support of approval of an ANDA. An ANDA provides for marketing of a drug product that has the same active ingredients in the same strengths and dosage form as the listed drug and has been shown through bioequivalence testing to be therapeutically equivalent to the listed drug. Other than the requirement for bioequivalence testing, ANDA applicants are usually not required to conduct, or submit results of, nonclinical or clinical tests to prove the safety or effectiveness of their drug product. Drugs approved in this way are commonly referred to as "generic equivalents" to the listed drug and can often be substituted by pharmacists under prescriptions written for the original listed drug.

The ANDA applicant is required to make certain certifications to the FDA concerning any patents listed for the approved product in the FDA's Orange Book. Specifically, the applicant must certify that: (i) the required patent information has not been filed; (ii) the listed patent has expired; (iii) the listed patent has not expired but will expire on a particular date and approval is sought after patent expiration; or (iv) the listed patent is invalid or will not be infringed by the new product. The ANDA applicant may also elect to submit a Section viii statement, certifying that its proposed ANDA label does not contain or carve out any language regarding the patented method-of-use, rather than certify to a listed method-of-use patent.

If the applicant does not challenge the listed patents, the ANDA will not be approved until all the listed patents claiming the referenced product have expired. A certification that the new product will not infringe the already approved product's listed patents, or that such patents are invalid, is called a Paragraph IV certification. If the ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days of the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months from receiving the Paragraph IV certification, expiration of the patent, settlement of the lawsuit, or a decision in the infringement case that is favorable to the ANDA applicant. Also, the ANDA will not be approved until any applicable non-patent exclusivity listed in the Orange Book for the referenced product has expired.

Exclusivity

Upon NDA approval of a new chemical entity, or NCE, which is a drug that contains an active moiety that has not been approved by the FDA in any other NDA, that drug receives five years of marketing exclusivity during which time the FDA cannot accept any ANDA seeking approval of a generic version of that drug. Certain changes to a drug, such as the addition of a new indication to the package insert, are associated with a three-year period of exclusivity during which the FDA cannot approve an ANDA for a generic drug that includes such changes.

An ANDA may be submitted one year before NCE exclusivity expires if a Paragraph IV certification is filed. If there is no listed patent in the Orange Book, there may not be a Paragraph IV certification, and, thus, no ANDA may be filed before the expiration of the exclusivity period.

On August 23, 2018, Keryx submitted a Citizen Petition requesting, *inter alia*, that FDA recognize that Auryxia is eligible for five years of NCE exclusivity based on its novel active ingredient and for three years exclusivity for the IDA Indication. On January 19, 2019, FDA responded that Auryxia is eligible for a three-year exclusivity period for the IDA Indication, which expires on November 6, 2020. FDA, however, denied the NCE exclusivity based on its determination that Auryxia contains a previously-approved active moiety (ferric cation). FDA's decision on the Citizen Petition is subject to further review both within FDA and in the courts. On February 21, 2019, Akebia filed a Petition for Reconsideration of FDA's decision on the NCE determination for Auryxia.

Patent Term Extension

After NDA approval, owners of relevant drug patents or their agents may apply for up to a five-year patent extension for delays caused by FDA regulatory review. The allowable patent term extension is calculated as half of the drug's testing phase which is the time between IND submission and NDA submission, and all of the review phase, which is the time between NDA submission and approval, up to a maximum of five years. The time can be shortened if the FDA determines that the applicant did not pursue approval with due diligence. The total patent term after the extension may not exceed 14 years.

We have filed applications under the patent term extension provisions of 35 U.S.C. § 156 for U.S. Patent Nos. 8,299,298, 8,093,423, 7,767,851, 5,753,706, and 8,338,642 each of which covers Auryxia for delays caused by FDA regulatory review. If granted, we can utilize the patent term extension on one of these patents, however, we cannot assure you that we can obtain any extension of the term of these patents. Upon expiration of these patents, competitors who obtain the requisite regulatory approval may potentially offer products with the same composition and/or method of use as our product, so long as the competitors do not infringe any other patents that we may own or license.

For patents that might expire before a determination regarding patent term extension, the patent owner or its agent may request an interim patent term extension. An interim patent extension increases the patent term by one year and may be renewed up to four times. For each interim patent extension granted, the post-approval patent extension is reduced by one year. The director of the USPTO must determine that approval of the drug covered by the patent for which a patent extension is being sought is likely. We have filed for and received interim patent term extension in accordance with 35 U.S.C. § 156(e)(2) for U.S. Patent No. 5,753,706, which currently has an expiration date of February 3, 2021.

In addition, certain jurisdictions outside of the U.S., including Japan, have provisions that provide for patent term extension. In October 2014, following the regulatory approval of Riona in Japan, the Japan Patent office granted the patent term extensions filed by our sublicensee, JT, for Japanese Patents Nos. 4964585 and 4173553. As a result of the extension of patent term, Japanese Patents Nos. 4964585 and 4173553 will expire in November 2025 and November 2022, respectively.

Competition

The pharmaceutical and biotechnology industries are highly competitive. Our competitors include pharmaceutical companies and biotechnology companies, as well as universities and public and private research institutions. In addition, companies that are active in different but related fields represent substantial competition for us. Many of our competitors have significantly greater capital resources, larger research and development staffs and facilities and greater experience in drug development, regulation, manufacturing and marketing than we do. These organizations also compete with us to recruit qualified personnel, attract partners for joint ventures or other collaborations, and license technologies that are competitive with ours. To compete successfully in this industry, we must identify novel and unique drugs or methods of treatment and then complete the development of those drugs as treatments in advance of our competitors.

Vadadustat

If vadadustat is approved and launched commercially, competing branded drugs may include EPOGEN[®] (epoetin alfa) and Aranesp[®] (darbepoetin alfa), both commercialized by Amgen, Procrit[®] (epoetin alfa) and Eprex[®] (epoetin alfa), commercialized by Johnson & Johnson in the United States and Europe, respectively, and Mircera[®] (methoxy PEG-epoetin beta), commercialized by Vifor Pharma in the United States and Roche Holding Ltd. outside the United States. We may also face competition from potential new anemia therapies. There are several other HIF-PHI product candidates in various stages of active development for anemia indications that may be in direct competition with vadadustat if and when they are approved and launched commercially. These candidates are being developed by such companies as FibroGen, Japan Tobacco International, GlaxoSmithKline plc and Bayer HealthCare AG. FibroGen, together with its collaboration partners, Astellas Pharma Inc. and AstraZeneca PLC, is currently in global Phase 3 clinical development of its product candidate, roxadustat. The product has launched for DD-CKD in Japan and both DD-CKD and NDD-CKD in China. FibroGen announced that the FDA has completed its filing review of its NDA for roxadustat for both DD-CKD and NDD-CKD and set a Prescription Drug User Fee Act date of December 20, 2020. They have stated they expect Astellas to file a marketing authorization application in the EU, or MAA, for both indications in the second quarter of 2020. GlaxoSmithKline plc is currently in global Phase 3 clinical development of its product candidate, daprodustat. Japan Tobacco International and Bayer HealthCare AG are currently in Phase 3 clinical development of their product candidates in Japan. GlaxoSmithKline plc and Japan Tobacco International have submitted NDAs for their product candidates for the treatment of renal anemia in Japan. In addition, certain companies are developing potential new therapies for renal-related diseases that could potentially reduce injectable ESA utilization and thus limit the market potential for vadadustat if they are approved and launched commercially. Other new therapies are in development for the treatment of conditions inclusive of renal anemia that may impact the market for anemia-targeted treatment.

A biosimilar is a biologic product that is approved based on demonstrating that it is highly similar to an existing, FDA-approved branded biologic product. The patents for the existing, branded biologic product must expire in a given market before biosimilars may enter that market without risk of being sued for patent infringement. In addition, an application for a biosimilar product cannot be approved by the FDA until 12 years after the existing, branded product was approved under a Biologics License Application, or BLA. The patents for epoetin alfa, an injectable ESA, expired in 2004 in the European Union, and the remaining patents expired between 2012 and 2016 in the United States. Because injectable ESAs are biologic products, the introduction of biosimilars into the injectable ESA market in the United States will constitute additional competition for vadadustat if we are able to obtain approval for and commercially launch our product. Several biosimilar versions of injectable ESAs are available for sale in the European Union. In the United States, Pfizer's biosimilar version of injectable ESAs, Retacrit[®] (epoetin alfa-epbx), was approved by the FDA in May 2018 and launched in November 2018 by Vifor Pharma.

Auryxia

Hyperphosphatemia Competition

Auryxia competes in the Hyperphosphatemia Indication in the United States with other FDA-approved phosphate binders such as Renagel[®] (sevelamer hydrochloride) and Renvela[®] (sevelamer carbonate), both marketed by Genzyme Corporation (a wholly-owned subsidiary of Sanofi), PhosLo[®] and Phoslyra[®] (calcium acetate), marketed by Fresenius Medical Care North America, Fosrenol[®] (lanthanum carbonate), marketed by Shire Pharmaceuticals Group plc, and Velphoro[®] (sucroferric oxyhydroxide), marketed by Fresenius Medical Care North America, as well as over-the-counter calcium carbonate products such as TUMS[®] and metal-based options such as aluminum, lanthanum and magnesium. Many of the phosphate binders listed above are now also available in generic forms. In addition, other phosphate binders are in various phases of development, including OPKO Health Inc.'s Alpharen[™] Tablets (fermagate tablets) and Ardelyx, Inc.'s tenapanor, that may impact the market for Auryxia.

Iron Deficiency Anemia Competition

Auryxia competes in the IDA Indication in the United States with over-the-counter oral iron, other prescription oral iron formulations, including ferrous sulfate, ferrous gluconate, ferrous fumarate, and polysaccharide iron complex, and IV iron formulations, including Feraheme® (ferumoxytol injection), Venofer® (iron sucrose injection), Ferrlicit® (sodium ferric gluconate complex in sucrose injection), Injectafer® (ferric carboxymaltose injection), and Triferic® (ferric pyrophosphate citrate).

In addition, other new therapies are available for the treatment of IDA that may impact the market for Auryxia, such as Shield Therapeutics' ferric maltol, which is currently approved in Europe as Ferracru® for IDA and more recently in the United States as Accrufer®.

Government Regulation and Product Approvals

Government authorities in the United States, at the federal, state and local level, and in other countries and jurisdictions, including the European Union, extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, sales, pricing, reimbursement, post-approval monitoring and reporting, and import and export of pharmaceutical products. The processes for obtaining regulatory approvals in the United States and in foreign countries and jurisdictions, along with subsequent compliance with applicable statutes and regulations and other regulatory requirements, require the expenditure of substantial time and financial resources.

Review and Approval of Drug Products in the United States

In the United States, the FDA approves and regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and implementing regulations. The failure to comply with applicable requirements under the FDCA and other applicable laws at any time during the product development process, approval process or after approval may subject an applicant and/or sponsor to a variety of administrative or judicial sanctions, including refusal by the FDA to approve pending applications, withdrawal of an approval, imposition of a clinical hold, issuance of warning letters and other types of letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement of profits, or civil or criminal investigations and penalties brought by the FDA and the Department of Justice or other governmental entities.

An applicant seeking approval to market and distribute a new drug product in the United States must typically undertake the following:

- completion of preclinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice, or GLP, regulations and consistent with International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use, or ICH, requirements;
- submission to the FDA of an IND, which must be reviewed and active by the FDA before human clinical trials may begin;
- approval by an independent local or central institutional review board, or IRB, representing each clinical site before each clinical trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with good clinical practices, or GCP, to establish the safety and efficacy of the proposed product candidate for each indication;
- preparation and submission to the FDA of an NDA requesting marketing for one or more proposed indications;
- review of the product candidate by an FDA advisory committee, where appropriate or if applicable;
- satisfactory completion of one or more FDA inspections of the manufacturing facility or facilities at which the product candidate, or components thereof, are produced to assess compliance with current Good Manufacturing Practices, or cGMP, requirements and to assure that the facilities, methods and controls are adequate to preserve the product candidate's identity, strength, quality and purity;
- satisfactory completion of FDA audits of clinical trial sites and records to assure compliance with GCPs and good practices, or GxPs, the integrity of the clinical data and that adequate controls and oversight are in place regarding manufacturing, clinical trials, pharmacovigilance, safety, data management, vendor oversight, collection and reporting of serious adverse events and other activities;
- payment of user fees and securing FDA approval of an NDA; and
- compliance with any post-approval requirements and/or commitments, including the potential requirement to implement a risk evaluation and mitigation strategy, or REMS, and potentially post-market requirement, or PMR, and commitment, or PMC, studies.

Preclinical Studies

Before an applicant begins testing a compound with potential therapeutic value in humans, the product candidate enters the preclinical testing stage. Preclinical studies include laboratory evaluation of the purity and stability of the manufactured drug substance or active pharmaceutical ingredient and the formulated drug or drug product, as well as in vitro and animal studies to assess the safety and activity of the product candidate for initial testing in humans and to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations. The results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, are submitted to the FDA as part of an IND. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, and long-term toxicity studies, will likely continue after the IND is submitted through the time of the NDA submission.

The IND and IRB Processes

Clinical trials involve the administration of the investigational product to human patients under the supervision of qualified investigators in accordance with GCP requirements, which include, among other things, the requirement that all research patients provide their voluntary informed consent in writing before their participation in any clinical trial. Clinical trials are conducted under written study protocols detailing, among other things, the inclusion and exclusion criteria, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND.

An IND is an exemption from the FDCA that allows an unapproved drug to be shipped through interstate commerce for use in an investigational clinical trial and a request for FDA authorization to administer an investigational drug to humans. Such authorization must be obtained prior to interstate shipment and administration of any new drug that is not the subject of an approved NDA. As a required component of the IND application, applicants must submit a protocol for each clinical trial and any subsequent protocol amendments. In addition, the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical trials, among other things, are submitted to the FDA as part of an IND. The FDA requires a 30-day waiting period after the submission of each IND before clinical trials may begin. This waiting period is designed to allow the FDA to review the IND to determine whether human research patients will be exposed to unreasonable health risks. At any time during this 30-day period, or thereafter, the FDA may raise concerns or questions about the conduct of the trials as outlined in the IND and impose a clinical hold or partial clinical hold or require that the sponsor amend the clinical protocol to include additional safety measurements. In this case, the IND sponsor and the FDA must resolve any outstanding concerns before clinical trials can begin (or resume if the clinical trial had been ongoing at the time a clinical hold was imposed).

Following commencement of a clinical trial under an IND, the FDA may also place a clinical hold or partial clinical hold on that trial. A clinical hold is an order issued by the FDA to the sponsor to delay a proposed clinical investigation or to suspend an ongoing investigation. A partial clinical hold is a delay or suspension of only part of the clinical work requested under the IND. For example, a specific protocol or part of a protocol is not allowed to proceed, while other protocols may do so. No more than 30 days after imposition of a clinical hold or partial clinical hold, the FDA will provide the sponsor a written explanation of the basis for the hold. Following issuance of a clinical hold or partial clinical hold, an investigation may only resume after the FDA has notified the sponsor that the investigation may proceed. The FDA will base that determination on information provided by the sponsor correcting the deficiencies previously cited or otherwise satisfying the FDA that the investigation can proceed. Clinical holds are imposed by the FDA whenever there is concern for patient safety and may be a result of new data, findings, or developments in clinical, nonclinical, and/or chemistry, manufacturing, and controls, or CMC.

A sponsor may choose, but is not required, to conduct a foreign clinical trial under an IND. When a foreign clinical trial is conducted under an IND, all FDA IND requirements must be met unless waived. When the foreign clinical trial is not conducted under an IND, the sponsor must ensure that the trial complies with certain FDA regulatory requirements in order to use the trial as support for an IND or application for marketing approval. These requirements to protect the rights, welfare, and safety of patients are also stipulated in applicable ICH guidance.

In addition to the foregoing IND requirements, an IRB representing each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution, and the IRB must conduct a continuing review and reapprove the trial at least annually. The IRB must review and approve, among other things, the trial protocol and informed consent information to be provided to study patients. An IRB must operate in compliance with FDA regulations. An IRB can suspend or terminate approval of a clinical trial at its institution, or an institution it represents, if the clinical trial is not being conducted in accordance with the IRB's requirements or if the product candidate has been associated with unexpected serious harm to patients.

Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the trial sponsor, known as a data monitoring committee, or DMC. DMCs may be charged with monitoring efficacy, safety, and/or study conduct. A DMC provides a recommendation for whether or not a clinical trial should move forward at designated check points based on available data from the trial. A recommendation by a DMC to suspend or terminate development during any phase of clinical trials can occur if it is determined that the participants or patients are being exposed to an unacceptable health risk.

Information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health, or NIH, for public dissemination on its website.

Expanded Access to an Investigational Drug for Treatment Use

Expanded access, sometimes called “compassionate use,” is the use of investigational new drug products outside of clinical trials to treat patients with serious or immediately life-threatening diseases or conditions when there are no comparable or satisfactory alternative treatment options. The rules and regulations related to expanded access are intended to improve access to investigational drugs for patients who may benefit from investigational therapies. FDA regulations allow access to investigational drugs under an IND by the company or the treating physician for treatment purposes on a case-by-case basis for: individual patients (single-patient IND applications for treatment in emergency settings and non-emergency settings); intermediate-size patient populations; and larger populations for use of the drug under a treatment protocol or Treatment IND Application.

When considering an IND application for expanded access to an investigational product with the purpose of treating a patient or a group of patients, the sponsor and treating physicians or investigators will determine suitability when all of the following criteria apply: patient(s) have a serious or immediately life-threatening disease or condition and there is no comparable or satisfactory alternative therapy to diagnose, monitor, or treat the disease or condition; the potential patient benefit justifies the potential risks of the treatment and the potential risks are not unreasonable in the context or condition to be treated; and the expanded use of the investigational drug for the requested treatment will not interfere with initiation, conduct, or completion of clinical investigations that could support marketing approval of the product candidate or otherwise compromise the potential development of the product candidate.

On December 13, 2016, the 21st Century Cures Act, or Cures Act, established (and the 2017 Food and Drug Administration Reauthorization Act later amended) a requirement that sponsors of one or more investigational drugs for the treatment of a serious disease(s) or condition(s) make publicly available their policy for evaluating and responding to requests for expanded access for individual patients. Although these requirements were rolled out over time, they have now come into full effect. This provision requires drug and biologic companies to make publicly available their policies for expanded access for individual patient access to products intended for serious diseases. Sponsors are required to make such policies publicly available upon the earlier of initiation of a Phase 2 or Phase 3 study; or 15 days after the drug or biologic receives designation as a breakthrough therapy, fast track product, or regenerative medicine advanced therapy.

In addition, on May 30, 2018, the Right to Try Act was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug products that have completed a Phase I clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a drug manufacturer to make its product candidates available to eligible patients as a result of the Right to Try Act, but the manufacturer must develop an internal policy and respond to patient requests according to that policy.

Human Clinical Trials in Support of an NDA

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCP requirements, which include, among other things, the requirement that all research subjects provide their informed consent in writing before their participation in any clinical trial. Clinical trials are conducted under written study protocols detailing, among other things, the inclusion and exclusion criteria, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated.

Human clinical trials are typically conducted in four sequential phases, which may overlap or be combined:

- **Phase 1.** The product candidate is initially introduced into a small number of healthy human subjects or, in certain indications such as cancer, patients with the target disease or condition (e.g., cancer) and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness and to determine optimal dosage.

- **Phase 2.** The product candidate is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product candidate for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- **Phase 3.** These clinical trials are commonly referred to as “pivotal” studies, which denote a study that presents the data that the FDA or other relevant regulatory agency will use to determine whether or not to approve a product candidate. The product candidate is administered to an expanded patient population, generally at geographically dispersed clinical trial sites, in well-controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product candidate for approval, identify adverse effects, establish the overall risk-benefit profile of the product candidate and to provide adequate information for the labeling of the product candidate.
- **Phase 4.** Post-approval studies may be conducted after initial marketing approval. These studies are used to gain additional experience from the treatment of patients in the intended therapeutic indication.

Progress reports detailing the results of the clinical trials conducted under the IND must be submitted at least annually to the FDA and, more frequently, if serious adverse events occur. In addition, IND safety reports must be submitted to the FDA for any of the following: serious and unexpected suspected adverse reactions; findings from other studies or animal or in vitro testing that suggest a significant risk in humans exposed to the drug; and any clinically important increase in the case of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The FDA or the sponsor or the data monitoring committee may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution, or an institution it represents, if the clinical trial is not being conducted in accordance with the IRB’s requirements or if the drug has been associated with unexpected serious harm to patients. The FDA will typically inspect one or more clinical sites to assure compliance with GCP and the integrity of the clinical data submitted.

Under the Pediatric Research Equity Act of 2003, or PREA, an NDA or supplement thereto must contain data that are adequate to assess the safety and effectiveness of the drug product for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. With enactment of the Food and Drug Administration Safety and Innovation Act or FDASIA, in 2012, sponsors must also submit pediatric study plans prior to the assessment data. Those plans must contain an outline of the proposed pediatric study or studies the applicant plans to conduct, including study objectives and design, any deferral or waiver requests, and other information required by regulation. The legislation requires the FDA to meet with drug sponsors by no later than the end-of-Phase 1 meeting for serious or life-threatening diseases and by no later than ninety days after the FDA’s receipt of the study plan. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements.

Submission of an NDA to the FDA

Assuming successful completion of required clinical testing and other requirements, the results of the preclinical studies and clinical trials, together with detailed information relating to the product’s chemistry, manufacture, controls and proposed labeling, among other things are submitted to the FDA as part of an NDA requesting approval to market the product candidate for one or more indications. Under federal law, the submission of most NDAs is subject to an application user fee, which for federal fiscal year 2020 is \$2,942,965 for an application requiring clinical data. The sponsor of an approved NDA is also subject to an annual program fee, which for fiscal year 2020 is \$325,424. Certain exceptions and waivers are available for some of these fees, such as an exception from the application fee for product candidates with orphan designation and a waiver for certain small businesses.

The FDA conducts a preliminary review of an NDA within 60 days of its receipt and strives to inform the sponsor by the 74th day after the FDA’s receipt of the submission to determine whether the application is sufficiently complete to permit substantive review. This is known as the filing decision. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA has agreed to certain performance goals in the review process of NDAs. Most such applications are meant to be reviewed within ten months from the date of filing, and most applications for “priority review” products are meant to be reviewed within six months of filing. A product that has been designated as a breakthrough therapy may also be eligible for review within six months if supported by clinical data at the time of submission of the NDA. The review process may be extended by the FDA for three additional months to consider new information or clarification provided by the applicant to address an outstanding deficiency identified by the FDA following the original submission.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is or will be manufactured. These pre-approval inspections may cover all facilities associated with an NDA submission, including drug component manufacturing such as active pharmaceutical ingredients, finished drug product manufacturing, control testing laboratories, as well as packaging and labeling facilities. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. The applicant of the NDA may also have their records, processes, procedures, training, and other aspects reviewed during an inspection. The FDA must implement a protocol to expedite review of responses to inspection reports pertaining to certain drug applications, including applications for drugs in a shortage or drugs for which approval is dependent on remediation of conditions identified in the inspection report.

In addition, as a condition of approval, the FDA may require an applicant to develop a REMS. REMS use risk minimization strategies beyond the professional labeling to ensure that the benefits of the product outweigh the potential risks.

Finally, the FDA may refer an application for a novel drug to an advisory committee or explain why such referral was not made. Typically, an advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Fast Track, Breakthrough Therapy, Priority Review

The FDA is authorized to designate certain products for expedited review if they are intended to address an unmet medical need in the treatment of a serious or life-threatening disease or condition. These programs are referred to as fast track designation, breakthrough therapy designation, priority review designation.

Specifically, the FDA may designate a product for fast track review if it is intended, whether alone or in combination with one or more other drugs, for the treatment of a serious or life-threatening disease or condition, and it demonstrates the potential to address unmet medical needs for such a disease or condition. For fast track products, sponsors may have greater interactions with the FDA and the FDA may initiate review of sections of a fast track product's NDA before the application is complete. This rolling review may be available if the FDA determines, after preliminary evaluation of clinical data submitted by the sponsor, that a fast track product may be effective. The sponsor must also provide, and the FDA must approve, a schedule for the submission of the remaining information and the sponsor must pay applicable user fees. However, the FDA's time period goal for reviewing a fast track application does not begin until the last section of the NDA is submitted. In addition, the fast track designation may be withdrawn by the FDA if the FDA believes that the designation is no longer supported by data emerging in the clinical trial process.

Second, in 2012, Congress enacted the Food and Drug Administration Safety and Improvement Act. This law established a new regulatory scheme allowing for expedited review of products designated as "breakthrough therapies." A product may be designated as a breakthrough therapy if it is intended, either alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The FDA may take certain actions with respect to breakthrough therapies, including holding meetings with the sponsor throughout the development process; providing timely advice to the product sponsor regarding development and approval; involving more senior staff in the review process; assigning a cross-disciplinary project lead for the review team; and taking other steps to design the clinical trials in an efficient manner.

Third, the FDA may designate a product for priority review if it is a drug that treats a serious condition and, if approved, would provide a significant improvement in safety or effectiveness. The FDA determines, on a case-by-case basis, whether the proposed drug represents a significant improvement when compared with other available therapies. Significant improvement may be illustrated by evidence of increased effectiveness in the treatment of a condition, elimination or substantial reduction of a treatment-limiting drug reaction, documented enhancement of patient compliance that may lead to improvement in serious outcomes, and evidence of safety and effectiveness in a new subpopulation. A priority designation is intended to direct overall attention and resources to the evaluation of such applications, and to shorten the FDA's review clock goal for taking action on a marketing application from ten months to six months. For new chemical entities, or NCEs, the review clock starts after the NDA is filed with a total clock of twelve and eight months, respectively.

Priority Review Vouchers

A PRV is a voucher that the FDA issues to a sponsor of a rare pediatric disease or tropical disease product application at the time of the marketing application approval. Vouchers are transferrable to other sponsors that may apply it to their NDAs or BLAs. A PRV entitles the holder to designate a single human drug application submitted under Section 505(b)(1) of the U.S. Federal Food, Drug, and Cosmetic Act or Section 351 of the Public Health Service Act as qualifying for a priority review. An FDA priority review may expedite the review process of a marketing application reducing the review time from ten months after formal acceptance of the file to six months after formal acceptance of the file. Applying the PRV to a marketing application does not ensure the FDA's approval of the marketing application and all requirements supporting the safety and efficacy of the product must be met.

The FDA's Decision on an NDA

On the basis of the FDA's evaluation of the NDA and accompanying information, including the results of the inspection of the manufacturing facilities, the FDA may issue an approval letter or a complete response letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing, analyses, or information in order for the FDA to reconsider the application. This may include the requirement to conduct another clinical study or studies. If and when those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

If the FDA approves a product, it may limit the approved indications for use for the product, require that contraindications, warnings or precautions be included in the product labeling, require that post-approval studies, including Phase 4 clinical trials, be conducted to further assess the drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization, or impose other conditions, including distribution restrictions or other risk management mechanisms, including REMS, which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post-market studies or surveillance programs. After approval, many types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Post-Approval Requirements and Commitments

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling. In addition, conditions of NDA approval may include sponsor agreement to PMR or PMC studies, which are designed to further assess drug safety and effectiveness and may require testing and surveillance programs to monitor the safety of approved products that have been commercialized. These may include additional studies, registries, data collection, analyses, and/or information.

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing, annual user fee requirements for any marketed products and the establishments at which such products are manufactured, as well as new application fees for supplemental applications with clinical data.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon the sponsor and any third-party manufacturers that the sponsor may decide to use. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance.

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, suspension of the approval, or complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates the marketing, labeling, advertising and promotion of prescription drug products placed on the market. This regulation includes, among other things, standards and regulations for direct-to-consumer advertising, communications regarding unapproved uses, industry-sponsored scientific and educational activities, and promotional activities involving the Internet and social media. Promotional claims about a product candidate's safety or effectiveness are prohibited before the product candidate is approved. After approval, a drug product generally may not be promoted for uses that are not approved by the FDA or in a manner that is inconsistent with the product's prescribing information. In the United States, healthcare professionals are generally permitted to prescribe drugs for such uses not described in the drug's labeling, known as off-label uses, because the FDA does not regulate the practice of medicine. However, FDA regulations impose rigorous restrictions on manufacturers' communications, prohibiting the promotion of off-label uses. It may be permissible, under very specific conditions, for a manufacturer to engage in nonpromotional, truthful and non-misleading communication regarding off-label information, such as distributing scientific or medical journal information. In addition, companies may also promote information that is consistent with the prescribing information and have the ability to proactively speak to formulary committee members of payors regarding data for an unapproved drug or unapproved uses of an approved drug under some relatively recent guidance from the FDA. However, if a company is found to have promoted off-label uses, it may become subject to adverse public relations and administrative and judicial enforcement by the FDA, the Department of Justice, or the Office of the Inspector General of the Department of Health and Human Services, as well as state authorities. This could subject a company to a range of penalties that could have a significant commercial impact, including civil and criminal fines and agreements that materially restrict the manner in which a company promotes or distributes drug products. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed.

In addition, the distribution of prescription pharmaceutical products and drug samples are subject to the Prescription Drug Marketing Act, or PDMA, and its implementing regulations, as well as the Drug Supply Chain Security Act, or DSCA, which regulate the distribution and tracing of prescription drugs and prescription drug samples at the federal level and set minimum standards for the regulation of drug distributors by the states. The PDMA, its implementing regulations and state laws limit the distribution of prescription pharmaceutical product samples, and the DSCA imposes requirements to ensure accountability in distribution and to identify and remove counterfeit and other illegitimate products from the market.

Abbreviated New Drug Applications for Generic Drugs

In 1984, with passage of the Hatch-Waxman Amendments to the FDCA, Congress established an abbreviated regulatory scheme authorizing the FDA to approve generic drugs that are shown to contain the same active ingredients as, and to be bioequivalent to, drugs previously approved by the FDA pursuant to NDAs. To obtain approval of a generic drug, an applicant must submit an abbreviated new drug application, or ANDA, to the agency. An ANDA is a comprehensive submission that contains, among other things, data and information pertaining to the active pharmaceutical ingredient, bioequivalence, drug product formulation, specifications and stability of the generic drug, as well as analytical methods, manufacturing process validation data and quality control procedures. ANDAs are "abbreviated" because they generally do not include preclinical and clinical data to demonstrate safety and effectiveness. Instead, in support of such applications, a generic manufacturer may rely on the preclinical and clinical testing previously conducted for a drug product previously approved under an NDA, known as the reference-listed drug, or RLD.

Specifically, in order for an ANDA to be approved, the FDA must find that the generic version is identical to the RLD with respect to the active ingredients, the route of administration, the dosage form, the strength of the drug and the conditions of use of the drug. At the same time, the FDA must also determine that the generic drug is “bioequivalent” to the innovator drug. Under the statute, a generic drug is bioequivalent to an RLD if “the rate and extent of absorption of the drug do not show a significant difference from the rate and extent of absorption of the listed drug.” Upon approval of an ANDA, the FDA indicates whether the generic product is “therapeutically equivalent” to the RLD in its publication “Approved Drug Products with Therapeutic Equivalence Evaluations,” also referred to as the “Orange Book.” Physicians and pharmacists consider a therapeutic equivalent generic drug to be fully substitutable for the RLD. In addition, by operation of certain state laws and numerous health insurance programs, the FDA’s designation of therapeutic equivalence often results in substitution of the generic drug without the knowledge or consent of either the prescribing physician or patient.

Under the Hatch-Waxman Amendments, the FDA may not approve an ANDA until any applicable period of non-patent exclusivity for the RLD has expired. The FDCA provides a period of five years of non-patent data exclusivity for a new drug containing a new chemical entity. For the purposes of this provision, a new chemical entity, or NCE, is a drug that contains no active moiety that has previously been approved by the FDA in any other NDA. An active moiety is the molecule or ion responsible for the physiological or pharmacological action of the drug substance. In cases where such NCE exclusivity has been granted, an ANDA may not be filed with the FDA until the expiration of five years unless the submission is accompanied by a Paragraph IV certification, in which case the applicant may submit its application four years following the original product approval. The FDCA also provides for a period of three years of exclusivity if the NDA includes reports of one or more new clinical investigations, other than bioavailability or bioequivalence studies, that were conducted by or for the applicant and are essential to the approval of the application.

The FDCA also provides for a period of three years of exclusivity if the NDA includes reports of one or more new clinical investigations, other than bioavailability or bioequivalence studies, that were conducted by or for the applicant and are essential to the approval of the application. This three-year exclusivity period often protects changes to a previously approved drug product, such as a new dosage form, route of administration, combination or indication. Three-year exclusivity would be available for a drug product that contains a previously approved active moiety, provided the statutory requirement for a new clinical investigation is satisfied. Unlike five-year NCE exclusivity, an award of three-year exclusivity does not block the FDA from accepting ANDAs seeking approval for generic versions of the drug as of the date of approval of the original drug product. The FDA typically makes decisions about awards of data exclusivity shortly before a product is approved.

The FDA must establish a priority review track for certain generic drugs, requiring the FDA to review a drug application within eight months for a drug that has three or fewer approved drugs listed in the Orange Book and is no longer protected by any patent or regulatory exclusivities, or is on the FDA’s drug shortage list. The new legislation also authorizes FDA to expedite review of “competitor generic therapies” or drugs with inadequate generic competition, including holding meetings with or providing advice to the drug sponsor prior to submission of the application.

Hatch-Waxman Patent Certification and the 30-Month Stay

Upon approval of an NDA or a supplement thereto, NDA sponsors are required to list with the FDA each patent with claims that cover the applicant’s product or an approved method of using the product. Each of the patents listed by the NDA sponsor is published in the Orange Book. When an ANDA applicant files its application with the FDA, the applicant is required to certify to the FDA concerning any patents listed for the reference product in the Orange Book, except for patents covering methods of use for which the ANDA applicant is not seeking approval. To the extent that the Section 505(b)(2) applicant is relying on studies conducted for an already approved product, the applicant is required to certify to the FDA concerning any patents listed for the approved product in the Orange Book to the same extent that an ANDA applicant would.

Specifically, the applicant must certify with respect to each patent that:

- the required patent information has not been filed;
- the listed patent has expired;
- the listed patent has not expired, but will expire on a particular date and approval is sought after patent expiration; or
- the listed patent is invalid, unenforceable or will not be infringed by the new product.

A certification that the new product will not infringe the already approved product’s listed patents or that such patents are invalid or unenforceable is called a Paragraph IV certification. If the applicant does not challenge the listed patents or indicates that it is not seeking approval of a patented method of use, the application will not be approved until all the listed patents claiming the referenced product have expired (other than method of use patents involving indications for which the applicant is not seeking approval).

If the ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days after the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months after the receipt of the Paragraph IV notice, expiration of the patent, or a decision in the infringement case that is favorable to the ANDA applicant.

Pediatric Studies and Exclusivity

Pediatric exclusivity is another type of non-patent marketing exclusivity in the United States and, if granted, provides for the attachment of an additional six months of marketing protection to the term of any existing regulatory exclusivity, including the non-patent and orphan exclusivity. This six-month exclusivity may be granted if an NDA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data do not need to show the product is effective in the pediatric population studied, rather, if the clinical trial is deemed to fairly respond to the FDA's request, the additional protection is granted. If reports of requested pediatric studies are submitted to and accepted by the FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or patent protection cover the product are extended by six months. This is not a patent term extension, but it effectively extends the regulatory period during which the FDA cannot approve another application. With regard to patents, the six-month pediatric exclusivity period will not attach to any patents for which an ANDA or 505(b)(2) applicant submitted a paragraph IV patent certification, unless the NDA sponsor or patent owner first obtains a court determination that the patent is valid and infringed by the proposed product.

Patent Term Restoration and Extension

A patent claiming a new drug product may be eligible for a limited patent term extension under the Hatch-Waxman Act, which permits a patent restoration of up to five years for patent term lost during product development and the FDA regulatory review. The restoration period granted is typically one-half the time between the effective date of an IND and the submission date of an NDA, plus the time between the submission date of an NDA and the ultimate approval date. Patent term restoration cannot be used to extend the remaining term of a patent past a total of 14 years from the product's approval date. Only one patent applicable to an approved drug product is eligible for the extension, and the application for the extension must be submitted prior to the expiration of the patent in question. A patent that covers multiple drugs for which approval is sought can only be extended in connection with one of the approvals. The U.S. Patent and Trademark Office reviews and approves the application for any patent term extension or restoration in consultation with the FDA.

Review and Approval of Drug Products Outside the United States

In order to market any product outside of the United States, a company must also comply with numerous and varying regulatory requirements of other countries and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of drug products. Whether or not it obtains FDA approval for a product, the company would need to obtain the necessary approvals by the comparable foreign regulatory authorities before it can commence clinical trials or marketing of the product in those countries or jurisdictions. The approval process ultimately varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

Clinical Trial Approval in the European Union

Requirements for the conduct of clinical trials in the European Union including GCP are set forth in the Clinical Trials Directive 2001/20/EC, or the Clinical Trials Directive, and the GCP Directive 2005/28/EC, or the GCP Directive. Pursuant to the Clinical Trials Directive and the GCP Directive 2005/28/EC, as amended, a system for the approval of clinical trials in the European Union has been implemented through national legislation of the EU member states. Under this system, approval must be obtained from the competent national authority of each EU member state in which a study is planned to be conducted. To this end, a clinical trial application, or CTA, is submitted to the local competent authority in each country (or member state) where the clinical trial is being conducted, which must be supported by an investigational medicinal product dossier, or IMPD, and further supporting information prescribed by Clinical Trials Directive and the GCP Directive and other applicable guidance documents. These documents may be amended and/or updated by the EC at any time. Furthermore, a clinical trial may only be started after a competent ethics committee has issued a favorable opinion on the clinical trial application in that country.

In April 2014, the European Union passed the new Clinical Trials Regulation (EU) No 536/2014, or the new Clinical Trials Regulation, which is set to replace the current Clinical Trials Directive. To ensure that the rules for clinical trials are identical throughout the European Union, the new EU clinical trials legislation was passed as a regulation that is directly applicable in all EU member states. All clinical trials performed in the European Union are required to be conducted in accordance with the Clinical Trials Directive until the new Clinical Trials Regulation becomes applicable. According to the current plans of the European Medicines Agency, or EMA, the new Clinical Trials Regulation is expected to become applicable in 2020. The Clinical Trials Directive will, however, still apply three years from the date of entry into application of the new Clinical Trials Regulation to (i) clinical trials applications submitted before the entry into application and (ii) clinical trials applications submitted within one year after the entry into application if the sponsor opts for old system.

The new Clinical Trials Regulation aims to simplify and streamline the approval of clinical trial in the European Union. The main characteristics of the regulation include: a streamlined application procedure via a single entry point, the EU portal; a single set of documents to be prepared and submitted for the application as well as simplified reporting procedures that will spare sponsors from submitting broadly identical information separately to various bodies and different member states; a harmonized procedure for the assessment of applications for clinical trials, which is divided in two parts (Part I is assessed jointly by all member states concerned, and Part II is assessed separately by each member state concerned); strictly defined deadlines for the assessment of clinical trial applications; and the involvement of the ethics committees in the assessment procedure in accordance with the national law of the member state concerned but within the overall timelines defined by the Clinical Trials Regulation.

As in the United States, there are similar requirements in the European Union for posting clinical trial information online, and in other countries as well.

PRIME Designation in the European Union

In March 2016, the EMA launched an initiative, the PRiority MEdicines, or PRIME, scheme, to facilitate development of product candidates in indications, often rare, for which few or no therapies currently exist. The PRIME scheme is intended to encourage drug development in areas of unmet medical need and provides accelerated assessment of products representing substantial innovation reviewed under the centralized procedure. Products from small- and medium-sized enterprises, or SMEs, may qualify for earlier entry into the PRIME scheme than larger companies. Many benefits accrue to sponsors of product candidates with PRIME designation, including but not limited to, early and proactive regulatory dialogue with the EMA, frequent discussions on clinical trial designs and other development program elements, and accelerated marketing authorization application assessment once a dossier has been submitted. Importantly, a dedicated agency contact and rapporteur from the Committee for Human Medicinal Products, or CHMP, or Committee for Advanced Therapies, or CAT, are appointed early in the PRIME scheme, facilitating increased understanding of the product at the EMA's committee level. A kick-off meeting initiates these relationships and includes a team of multidisciplinary experts at the EMA to provide guidance on the overall development and regulatory strategies.

Marketing Authorization

To obtain marketing approval of a product under EU regulatory systems, an applicant must submit a marketing authorization application, or MAA, either under a centralized or decentralized procedure. The centralized procedure provides for the grant of a single marketing authorization by the European Commission that is valid for all EU member states. The centralized procedure is compulsory for specific products, including for medicines produced by certain biotechnological processes, products designated as orphan medicinal products, advanced therapy products and products with a new active substance indicated for the treatment of certain diseases. For products with a new active substance indicated for the treatment of other diseases and products that are highly innovative or for which a centralized process is in the interest of patients, the centralized procedure may be optional.

Under the centralized procedure, the Committee for Medicinal Products for Human Use, or the CHMP, established at the EMA is responsible for conducting the initial assessment of a product. The CHMP is also responsible for several post-authorization and maintenance activities, such as the assessment of modifications or extensions to an existing marketing authorization. Under the centralized procedure in the European Union, the maximum timeframe for the evaluation of an MAA is 210 days, excluding clock stops, when additional information or written or oral explanation is to be provided by the applicant in response to questions of the CHMP. Accelerated evaluation might be granted by the CHMP in exceptional cases, when a medicinal product is of major interest from the point of view of public health and in particular from the viewpoint of therapeutic innovation. In this circumstance, the EMA ensures that the opinion of the CHMP is given within 150 days.

The decentralized procedure is available to applicants who wish to market a product in various EU member states where such product has not received marketing approval in any EU member state before. The decentralized procedure provides for approval by one or more other, or concerned, member states of an assessment of an application performed by one member state designated by the applicant, known as the reference member state. Under this procedure, an applicant submits an application based on identical dossiers and related materials, including a draft summary of product characteristics, and draft labeling and package leaflet, to the reference member state and concerned member states. The reference member state prepares a draft assessment report and drafts of the related materials within 210 days after receipt of a valid application. Within 90 days of receiving the reference member state's assessment report and related materials, each concerned member state must decide whether to approve the assessment report and related materials.

If a member state cannot approve the assessment report and related materials on the grounds of potential serious risk to public health, the disputed points are subject to a dispute resolution mechanism and may eventually be referred to the European Commission, whose decision is binding on all member states.

Within this framework, manufacturers may seek approval of hybrid medicinal products under Article 10(3) of Directive 2001/83/EC. Hybrid applications rely, in part, on information and data from a reference product and new data from appropriate pre-clinical tests and clinical trials. Such applications are necessary when the proposed product does not meet the strict definition of a generic medicinal product, or bioavailability studies cannot be used to demonstrate bioequivalence, or there are changes in the active substance(s), therapeutic indications, strength, pharmaceutical form or route of administration of the generic product compared to the reference medicinal product. In such cases the results of tests and trials must be consistent with the data content standards required in the Annex to the Directive 2001/83/EC, as amended by Directive 2003/63/EC.

Hybrid medicinal product applications have automatic access to the centralized procedure when the reference product was authorized for marketing via that procedure. Where the reference product was authorized via the decentralized procedure, a hybrid application may be accepted for consideration under the centralized procedure if the applicant shows that the medicinal product constitutes a significant therapeutic, scientific or technical innovation, or the granting of a community authorization for the medicinal product is in the interest of patients at the community level.

A marketing authorization may be granted only to an applicant established in the European Union. Regulation (EC) No. 1901/2006, or Pediatric Regulation, provides that prior to obtaining a marketing authorization in the European Union, an applicant must demonstrate compliance with all measures included in a Pediatric Investigation Plan, or PIP, approved by the Pediatric Committee of the EMA, or PDCO, covering all subsets of the pediatric population, unless the EMA has granted a product-specific waiver, class waiver, or a deferral for one or more of the measures included in the PIP. The PIP sets out the timing and measures proposed to generate data to support a pediatric indication of the drug for which marketing authorization is being sought. The PDCO can grant a deferral of the obligation to implement some or all of the measures of the PIP until there are sufficient data to demonstrate the efficacy and safety of the product in adults. Further, the obligation to provide pediatric clinical trial data can be waived by the PDCO when these data is not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the marketing authorization is obtained in all member states of the European Union and study results are included in the product information, even when negative, the product is eligible for six months' supplementary protection certificate extension. For orphan-designated medicinal products, the 10-year period of market exclusivity is extended to 12 years.

Periods of Authorization and Renewals in the European Union

A marketing authorization is valid for five years, in principle, and it may be renewed after five years on the basis of a reevaluation of the risk-benefit balance by the EMA or by the competent authority of the relevant EU member state. To that end, the marketing authorization holder must provide the EMA or the relevant competent authority of the EU member state with a consolidated version of the file in respect of quality, safety and efficacy, including all variations introduced since the marketing authorization was granted, at least six months before the marketing authorization ceases to be valid. Once renewed, the marketing authorization is valid for an unlimited period, unless the European Commission or the relevant competent authority of the EU member state decides, on justified grounds relating to pharmacovigilance, to proceed with one additional five-year renewal period. Any marketing authorization that is not followed by the marketing of the medicinal product on the EU market (in the case of the centralized procedure) or on the market of the EU member state which delivered the marketing authorization within three years after authorization ceases to be valid.

Regulatory Data Exclusivity in the European Union

In the European Union, innovative medicinal products authorized in the European Union on the basis of a full marketing authorization application (as opposed to an application for marketing authorization that relies on data available in the marketing authorization dossier for another, previously approved, medicinal product) are entitled to eight years of data exclusivity. During this period, applicants for authorization of generics of these innovative products cannot rely on data contained in the marketing authorization dossier submitted for the innovative medicinal product. Innovative medicinal products are also entitled to ten years' market

exclusivity. During this ten-year period no generic of this medicinal product can be placed on the EU market. The overall ten-year period will be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to authorization, is held to bring a significant clinical benefit in comparison with existing therapies. Even if a compound is considered to be a new chemical entity so that the innovator gains the prescribed period of data exclusivity, another company may market another version of the product if such company obtained marketing authorization based on an MAA with a complete independent data package of pharmaceutical tests, preclinical tests and clinical trials.

Pediatric Studies and Exclusivity

Prior to submitting a marketing authorization application in the European Union, applicants must demonstrate compliance with all measures included in an EMA approved PIP covering all subsets of the pediatric population, unless the EMA has granted a product-specific waiver, a class waiver, or a deferral for one or more of the measures included in the PIP. The respective requirements for all marketing authorization procedures are set forth in the Pediatric Regulation. This requirement also applies when a company wants to add a new indication, pharmaceutical form or route of administration for a medicine that is already authorized. The Pediatric Committee of the EMA, or PDCO, may grant deferrals for some medicines, allowing a company to delay development of the medicine for children until there is enough information to demonstrate its effectiveness and safety in adults. The PDCO may also grant waivers when development of a medicine for children is not needed or is not appropriate, such as for diseases that only affect the elderly population. Before an MAA can be filed, or an existing marketing authorization can be amended, the EMA determines that companies actually comply with the agreed studies and measures listed in each relevant PIP. If an applicant obtains a marketing authorization in all EU member states, or a marketing authorization granted in the Centralized Procedure by the European Commission, and the study results for the pediatric population are included in the product information, even when negative, the medicine is then eligible for an additional six month period of qualifying patent protection through extension of the term of the Supplementary Protection Certificate.

Brexit and the Regulatory Framework in the United Kingdom

On June 23, 2016, the electorate in the United Kingdom voted in favor of leaving the European Union, commonly referred to as Brexit. Following protracted negotiations, the United Kingdom left the European Union on January 31, 2020. Under the withdrawal agreement, there is a transitional period until December 31, 2020 (extendable up to two years). Discussions between the United Kingdom and the EU have so far mainly focused on finalizing withdrawal issues and transition agreements but have been extremely difficult to date. To date, only an outline of a trade agreement has been reached. Much remains open, but the Prime Minister has indicated that the United Kingdom will not seek to extend the transitional period beyond the end of 2020. If no trade agreement has been reached before the end of the transitional period, there may be significant market and economic disruption. The Prime Minister has also indicated that the United Kingdom will not accept high regulatory alignment with the European Union.

Since the regulatory framework for pharmaceutical products in the United Kingdom covering quality, safety, and efficacy of pharmaceutical products, clinical trials, marketing authorization, commercial sales, and distribution of pharmaceutical products is derived from EU directives and regulations, Brexit could materially impact the future regulatory regime that applies to products and the approval of product candidates in the United Kingdom. Any delay in obtaining, or an inability to obtain, any marketing approvals, as a result of Brexit or otherwise, may force us to restrict or delay efforts to seek regulatory approval in the United Kingdom and/or the European Union for our product candidates, which could significantly and materially harm our business.

General Data Protection Regulation

The collection, use, disclosure, transfer, or other processing of personal data regarding individuals in the European Union, including personal health data, is subject to the EU General Data Protection Regulation, or GDPR, which became effective on May 25, 2018. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including requirements relating to processing health and other sensitive data, obtaining consent of the individuals to whom the personal data relates when required, providing information to individuals regarding data processing activities, implementing safeguards to protect the security and confidentiality of personal data, providing notification of data breaches, and taking certain measures when engaging third-party processors. The GDPR also imposes strict rules on the transfer of personal data to countries outside the European Union, including the United States, and permits data protection authorities to impose large penalties for violations of the GDPR, including potential fines of up to €20 million or 4% of annual global revenues, whichever is greater. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. Compliance with the GDPR will be a rigorous and time-intensive process that may increase the cost of doing business or require companies to change their business practices to ensure full compliance.

Pharmaceutical Coverage, Pricing and Reimbursement

In the United States and markets in other countries, patients who are prescribed treatments for their conditions and providers performing the prescribed services generally rely on third-party payors to reimburse all or part of the associated healthcare costs. Significant uncertainty exists as to the coverage and reimbursement status of products approved by the FDA and other government authorities. Thus, even if a product candidate is approved, sales of the product will depend, in part, on the extent to which third-party payors, including government health programs in the United States such as Medicare and Medicaid, commercial health insurers and managed care organizations, provide coverage, and establish adequate reimbursement levels for, the product. The process for determining whether a payor will provide coverage for a product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the product once coverage is approved. Third-party payors are increasingly challenging the prices charged, examining the medical necessity, and reviewing the cost-effectiveness of medical products and services and imposing controls to manage costs. Third-party payors may limit coverage to specific products on an approved list, also known as a formulary, which might not include all of the approved products for a particular indication.

In order to secure coverage and reimbursement for any product that might be approved for sale, a company may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costs required to obtain FDA or other comparable marketing approvals. Nonetheless, product candidates may not be considered medically necessary or cost effective. A decision by a third-party payor not to cover a product candidate could reduce physician utilization once the product is approved and have a material adverse effect on sales, results of operations and financial condition. Additionally, a payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a drug product does not assure that other payors will also provide coverage and reimbursement for the product, and the level of coverage and reimbursement can differ significantly from payor to payor.

The containment of healthcare costs also has become a priority of federal, state and foreign governments and the prices of drugs have been a focus in this effort. Governments have shown significant interest in implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit a company's revenue generated from the sale of any approved products. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which a company or its collaborators receive marketing approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

For example, there have been several recent U.S. congressional inquiries and proposed federal and proposed and enacted state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products. At the federal level, Congress and the current administration, or Administration, have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. For example, on May 11, 2018, the Administration issued a plan to lower drug prices. Under this blueprint for action, the Administration indicated that the Department of Health and Human Services, or HHS, will: take steps to end the gaming of regulatory and patent processes by drug makers to unfairly protect monopolies; advance biosimilars and generics to boost price competition; evaluate the inclusion of prices in drug makers' advertisements to enhance price competition; speed access to and lower the cost of new drugs by clarifying policies for sharing information between insurers and drug makers; avoid excessive pricing by relying more on value-based pricing by expanding outcome-based payments in Medicare and Medicaid; work to give Part D plan sponsors more negotiation power with drug makers; examine which Medicare Part B drugs could be negotiated for a lower price by Part D plans, and improving the design of the Part B Competitive Acquisition Program; update Medicare's drug-pricing dashboard to increase transparency; prohibit Part D contracts that include "gag rules" that prevent pharmacists from informing patients when they could pay less out-of-pocket by not using insurance; and require that Part D plan members be provided with an annual statement of plan payments, out-of-pocket spending, and drug price increases. In addition, on December 23, 2019, the Administration published a proposed rulemaking that, if finalized, would allow states or certain other non-federal government entities to submit importation program proposals to FDA for review and approval. Applicants would be required to demonstrate their importation plans pose no additional risk to public health and safety and will result in significant cost savings for consumers. At the same time, FDA issued draft guidance that would allow manufacturers to import their own FDA-approved drugs that are authorized for sale in other countries (multi-market approved products).

At the state level, individual states are increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional health care authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other health care programs. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing. It is expected that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

Outside the United States, ensuring adequate coverage and payment for a product also involves challenges. Pricing of prescription pharmaceuticals is subject to governmental control in many countries. Pricing negotiations with governmental authorities can extend well beyond the receipt of regulatory marketing approval for a product and may require a clinical trial that compares the cost effectiveness of a product to other available therapies. The conduct of such a clinical trial could be expensive and result in delays in commercialization.

In the European Union, pricing and reimbursement schemes vary widely from country to country. Some countries provide that products may be marketed only after a reimbursement price has been agreed. Some countries may require the completion of additional studies that compare the cost-effectiveness of a particular drug candidate to currently available therapies or so-called health technology assessments, in order to obtain reimbursement or pricing approval. For example, the European Union provides options for its member states to restrict the range of products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. EU member states may approve a specific price for a product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the product on the market. Other member states allow companies to fix their own prices for products but monitor and control prescription volumes and issue guidance to physicians to limit prescriptions. Recently, many countries in the European Union have increased the amount of discounts required on pharmaceuticals and these efforts could continue as countries attempt to manage healthcare expenditures, especially in light of the severe fiscal and debt crises experienced by many countries in the European Union. The downward pressure on health care costs in general, particularly prescription drugs, has become intense. As a result, increasingly high barriers are being erected to the entry of new products. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various EU member states, and parallel trade, i.e., arbitrage between low-priced and high-priced member states, can further reduce prices. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any products, if approved in those countries.

Healthcare Law and Regulation

Healthcare providers and third-party payors play a primary role in the recommendation and prescription of drug products that are granted marketing approval. Arrangements with providers, consultants, third-party payors and customers are subject to broadly applicable fraud and abuse, anti-kickback, false claims laws, reporting of payments to physicians, teaching hospitals and other healthcare providers, patient privacy laws and regulations, and other healthcare laws and regulations that may constrain business and/or financial arrangements. Restrictions under applicable federal and state healthcare laws and regulations include the following:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, offering, paying, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made, in whole or in part, under a federal healthcare program such as Medicare and Medicaid;
- the federal civil and criminal false claims laws, including the civil False Claims Act, and civil monetary penalties laws, which prohibit individuals or entities from, among other things, knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false, fictitious or fraudulent or knowingly making, using or causing to be made or used a false record or statement to avoid, decrease or conceal an obligation to pay money to the federal government.
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created additional federal criminal laws that prohibit, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their respective implementing regulations, including the Final Omnibus Rule published in January 2013, which impose obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal false statements statute, which prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the U.S. Foreign Corrupt Practices Act, or FCPA, which prohibits companies and their intermediaries from making, or offering or promising to make improper payments to non-U.S. officials for the purpose of obtaining or retaining business or otherwise seeking favorable treatment;

- the federal transparency requirements, known as the federal Physician Payments Sunshine Act (renamed the Open Payments Act), under the Patient Protection and Affordable Care Act, as amended by the Health Care Education Reconciliation Act, or ACA, which requires certain manufacturers of drugs, devices, biologics and medical supplies to report annually to the Centers for Medicare & Medicaid Services, or CMS, within the United States Department of Health and Human Services, information related to payments and other transfers of value made by that entity to physicians and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members;
- the PDMA and its implementation regulations, as well as the DSCA, which regulate the distribution and tracing of prescription drugs and prescription drug samples at the federal level, and set minimum standards for the regulation of drug distributors by the states; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to healthcare items or services that are reimbursed by third-party payors, including private insurers, and state gift ban and disclosure law requirements that differ from the federal Physician Payments Sunshine Act in terms of the nature and type of transfers of value that are reportable and the types of covered recipients.

Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines, such as the Pharmaceutical Research and Manufacturers of America Code on Interactions with Health Care Professionals, known as the PhRMA Code. State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Healthcare Reform

A primary trend in the United States healthcare industry and elsewhere is cost containment. There have been a number of federal and state proposals during the last few years regarding the pricing of pharmaceutical and biopharmaceutical products, limiting coverage and reimbursement for drugs and other medical products, government control and other changes to the healthcare system in the United States.

By way of example, the United States and state governments continue to propose and pass legislation designed to reduce the cost of healthcare.

In March 2010, the United States Congress enacted the ACA, which, among other things, includes changes to the coverage and payment for products under government health care programs. Among the provisions of the ACA of importance to our potential drug candidates are:

- an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents, apportioned among these entities according to their market share in certain government healthcare programs, although this fee would not apply to sales of certain products approved exclusively for orphan indications;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer's Medicaid rebate liability;
- expanded manufacturers' rebate liability under the Medicaid Drug Rebate Program by increasing the minimum rebate for both branded and generic drugs and revising the definition of "average manufacturer price," or AMP, for calculating and reporting Medicaid drug rebates on outpatient prescription drug prices and extending rebate liability to prescriptions for individuals enrolled in Medicare Advantage plans;
- addressed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- expanded the types of entities eligible for the 340B drug discount program;
- established the Medicare Part D coverage gap discount program by requiring manufacturers to provide a 50% point-of-sale-discount off the negotiated price of applicable brand drugs to eligible beneficiaries during their coverage gap period as a condition for the manufacturers' outpatient drugs to be covered under Medicare Part D;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- the Independent Payment Advisory Board, or IPAB, which has authority to recommend certain changes to the Medicare program to reduce expenditures by the program that could result in reduced payments for prescription drugs. However, the IPAB implementation has been not been clearly defined. The Affordable Care Act provided that under certain circumstances, IPAB recommendations will become law unless Congress enacts legislation that will achieve the same or greater Medicare cost savings; and

- established the Center for Medicare and Medicaid Innovation within CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending. Funding has been allocated to support the mission of the Center for Medicare and Medicaid Innovation from 2011 to 2019.

Other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. These changes include the Budget Control Act of 2011, which, among other things, led to aggregate reductions to Medicare payments to providers of 2% per fiscal year that started in 2013 and will stay in effect through 2029 unless additional Congressional action is taken, and the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several types of providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our product candidates for which we may obtain regulatory approval or the frequency with which any such product candidate is prescribed or used. Further, there have been several recent U.S. congressional inquiries and proposed state and federal legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products.

Since enactment of the ACA, there have been numerous legal challenges and Congressional actions to repeal and replace provisions of the law. For example, with enactment of the Tax Cuts and Jobs Act of 2017, which was signed by the President on December 22, 2017, Congress repealed the “individual mandate.” The repeal of this provision, which requires most Americans to carry a minimal level of health insurance, is no longer effective in 2019. According to the Congressional Budget Office, the repeal of the individual mandate will cause 13 million fewer Americans to be insured by 2027 and premiums in insurance markets may rise. Additionally, on January 22, 2018, the President signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called “Cadillac” tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, among other things, amended the ACA, effective January 1, 2019, to increase from 50 percent to 70 percent the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and to close the coverage gap in most Medicare drug plans, commonly referred to as the “donut hole”. Congress will likely consider other legislation to replace elements of the ACA during the next Congressional session.

In addition, on December 14, 2018, a U.S. District Court judge in the Northern District of Texas ruled that the individual mandate portion of the ACA is an essential and inseparable feature of the ACA, and therefore because the mandate was repealed as part of the Tax Cuts and Jobs Act, the remaining provisions of the ACA are invalid as well. The current administration and CMS have both stated that the ruling will have no immediate effect, and on December 30, 2018 the same judge issued an order staying the judgment pending appeal. The current administration recently represented to the Court of Appeals considering this judgment that it does not oppose the lower court’s ruling. On July 10, 2019, the Court of Appeals for the Fifth Circuit heard oral argument in this case. On December 18, 2019, that court affirmed the lower court’s ruling that the individual mandate portion of the ACA is unconstitutional and it remanded the case to the district court for reconsideration of the severability question and additional analysis of the provisions of the ACA. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

The Administration has also taken executive actions to undermine or delay implementation of the ACA. Since January 2017, the President has signed two Executive Orders designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. One Executive Order directs federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. The second Executive Order terminates the cost-sharing subsidies that reimburse insurers under the ACA. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. In addition, CMS has recently proposed regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the ACA for plans sold through such marketplaces. Further, on June 14, 2018, U.S. Court of Appeals for the Federal Circuit ruled that the federal government was not required to pay more than \$12 billion in ACA risk corridor payments to third-party payors who argued were owed to them. The effects of this gap in reimbursement on third-party payors, the viability of the ACA marketplace, providers, and potentially our business, are not yet known.

Laws Relating to Foreign Trade

We are subject to various federal and foreign laws that govern our international business practices. These laws include the FCPA which prohibits U.S. companies and their representatives from paying, offering to pay, promising, or authorizing the payment of anything of value to any foreign government official, government staff member, political party, or political candidate for the purposes of obtaining or retaining business, or to otherwise obtain favorable treatment or influence a person working in an official capacity. In many countries, the health care professionals we regularly interact with may meet the FCPA’s definition of a foreign government official. Additionally, interactions with or on the part of our partners, collaborators, contract research organizations, vendors or other agents may also implicate the FCPA. The FCPA also requires public companies to make and keep books and records that accurately

and fairly reflect their transactions and to devise and maintain an adequate system of internal accounting controls. Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents unique challenges in the pharmaceutical industry because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments made by pharmaceutical companies to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Our international operations could also be subject to compliance with national laws of other countries, such as the United Kingdom Bribery Act of 2010, or U.K. Bribery Act. The U.K. Bribery Act applies to any company “carrying on business” in the United Kingdom, irrespective of where the offending conduct occurs. The U.K. Bribery Act applies to bribery activities both in the public and private sector and prohibits the provision of an “advantage” intended to induce or reward “improper performance” of the recipient’s function. The failure by a company to prevent third parties from providing a bribe on its behalf could also constitute an offense. Penalties under the U.K. Bribery Act include potentially unlimited fines for companies and criminal sanctions for corporate officers under certain circumstances.

There are local antibribery and anticorruption laws in countries where we are conducting clinical trials, such as Brazil and Russia, and many of these also carry the risk of significant financial or criminal penalties. Our clinical trial operations could also result in enforcement actions by U.S., U.K., or other governmental authorities. There are also trade laws within the United States and in other regions that regulate the sale, purchase, import, export, reexport, transfer and shipment of goods, currency, products, materials, services and technology. Violations of these laws can lead to serious consequences, including substantial fines.

Other Regulations

We are also subject to numerous federal, state and local laws relating to such matters as safe working conditions, manufacturing practices, environmental protection, fire hazard control, and disposal of hazardous or potentially hazardous substances. We may incur significant costs to comply with such laws and regulations now or in the future.

Employees

As of December 31, 2019, we had 360 employees, 358 of whom were full-time. None of our employees is represented by any collective bargaining unit. We believe that we maintain good relations with our employees.

Available Information

Our principal executive offices are located at 245 First Street, Cambridge, Massachusetts 02142. Our telephone number is (617) 871-2098. Our website address is www.akebia.com. The information on our website or that may be accessed by links on our website is not incorporated by reference into this Form 10-K. We make available, free of charge and through our website, our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any amendments to any such reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after they are electronically filed with or furnished to the U.S. Securities and Exchange Commission.

Item 1A. Risk Factors

We face a variety of risks and uncertainties in our business. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also become important factors that affect our business. If any of the following risks occurs, our business, financial statements and future growth prospects could be materially and adversely affected.

Risks Related to our Financial Position and Need for Additional Capital

We have incurred significant losses since our inception, and anticipate that we will continue to incur significant losses and cannot guarantee when, if ever, we will become profitable or attain positive cash flows.

Investment in pharmaceutical product development and commercialization is highly speculative because it entails upfront capital expenditures and significant risk that a product candidate will fail to gain marketing approval or that an approved product will not be commercially viable. Since our inception, we have devoted most of our resources to research and development, including our preclinical and clinical development activities and, following the merger, or the Merger, whereby Keryx Biopharmaceuticals, Inc., or Keryx, became a wholly owned subsidiary of ours, commercialization. We have financed our operations primarily through sales of equity securities, our strategic collaborations and, following the Merger, product revenues and debt. Prior to the Merger, we had no products approved for commercial sale and had not generated any revenue from the sale of products. We are not currently profitable and have incurred net losses each year since our inception, including net losses of \$279.7 million for the year ended December 31, 2019. As of December 31, 2019, we had an accumulated deficit of \$794.1 million. We cannot guarantee when, if ever, we will become profitable. Our ability to generate product revenue and achieve profitability depends significantly on our success in many areas, including the following:

- developing, commercializing and marketing Auryxia, vadadustat, if approved, or any other product or product candidate, including those that may be in-licensed or acquired;
- completing preclinical and clinical development of our product candidates;
- seeking and obtaining marketing approvals for our product candidates after completion of clinical studies and the timing of such approvals, and maintaining marketing approvals for Auryxia or any other product;
- developing sustainable and scalable manufacturing processes for Auryxia, vadadustat and any other product or product candidate, including those that may be in-licensed or acquired;
- establishing and maintaining supply and manufacturing relationships with third parties that can provide adequate products that are compliant with good manufacturing practices, or GMPs, and services to support the clinical development and the market demand for our products and product candidates, including those that may be in-licensed or acquired;
- launching and commercializing our product candidates, if approved, either directly or with a collaborator or distributor;
- obtaining sufficient pricing and reimbursement for Auryxia, vadadustat and any other product or product candidate, including those that may be in-licensed or acquired, from private and governmental payors;
- obtaining market acceptance of Auryxia, vadadustat and any other product candidate, including those that may be in-licensed or acquired;
- the size of any market in which Auryxia, vadadustat and any other product or product candidate, including those that may be in-licensed or acquired, receives approval and obtaining adequate market share in those markets;
- addressing any competing products;
- identifying, assessing, acquiring, in-licensing and/or developing new product candidates;
- negotiating favorable terms in any transaction into which we may enter, including collaboration, merger, acquisition and licensing arrangements;
- maintaining, protecting and expanding our portfolio of intellectual property rights, including patents, trade secrets and know-how;
- integrating following the Merger; and
- attracting, hiring and retaining qualified personnel.

We expect to continue to incur significant expenses and operating losses for the foreseeable future. The amount of our future net losses will depend, in part, on the rate of our future expenditures, and our financial position will depend, in part, on our product revenue from Auryxia and, if approved, vadadustat, and our ability to obtain additional funding. We expect to continue to incur significant expenses if and as we:

- conduct our development program of vadadustat for the treatment of anemia due to chronic kidney disease, or CKD, including PRO₂TECT and INNO₂VATE and other ongoing or planned studies with respect to vadadustat, and develop plans for and conduct the preclinical and clinical development of any other potential product candidates;
- continue our commercialization activities for Auryxia and plan for the commercialization of vadadustat, if approved, and any other product or product candidate, including those that may be in-licensed or acquired;
- continue our Merger-related integration activities;
- seek marketing approvals for our product candidates that successfully complete clinical studies, and maintain marketing approvals for Auryxia and any product candidate for which we obtain marketing approval, including complying with any post-marketing regulatory requirements;
- have our product candidates manufactured for clinical trials and for commercial sale;
- initiate any post-marketing approval studies, Phase 4 studies or any other clinical trials for Auryxia or any other product, including those that may be in-licensed or acquired;
- seek to discover additional product candidates;
- engage in transactions, including strategic, merger, collaboration, acquisition and licensing transactions, pursuant to which we would market and develop commercial products, or develop and commercialize other product candidates and technologies;
- make royalty, milestone or other payments under our license agreements and any future license agreements;
- maintain, protect and expand our intellectual property portfolio;
- attract and retain skilled personnel;
- continue to create additional infrastructure and expend additional resources to support our operations as a public company, including any additional infrastructure and resources necessary to support the transition from our prior status as an emerging growth company; and
- experience any delays or encounter issues with any of the above.

We also could be forced to expend significant resources in our legal proceedings, as described under Part I, Item 3. Legal Proceedings, or any other such legal proceedings brought by or against us in the future.

Because of the numerous risks and uncertainties associated with pharmaceutical product development and commercialization, we are unable to accurately predict the timing or amount of increased expenses. The net losses we incur may fluctuate significantly from quarter to quarter and year to year, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance. In any particular quarter, the progress of our clinical development and our operating results could be below the expectations of securities analysts or investors, which could cause our stock price to decline.

Even if we succeed in receiving marketing approval for and are able to commercialize vadadustat, we will continue to incur substantial research and development and other expenditures to develop and market, if approved, any other product candidates as well as any costs relating to continued commercialization and post-marketing requirements for Auryxia, vadadustat and any other products or product candidates that may receive marketing approval, including those that may be in-licensed or acquired. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

Our expenses could increase beyond expectations if we are required by the U.S. Food and Drug Administration, or FDA, the European Medicines Agency, or EMA, or other regulatory authorities, or if we otherwise believe it is necessary, to change our manufacturing processes or assays, to amend or replace our study protocols, to repeat any of our clinical trials, to perform studies in addition to, different from or larger than those currently expected, or if there are any delays in completing our clinical trials or the development of any of our product candidates. Even if our product candidates are approved for commercial sale, we anticipate incurring significant costs associated with commercialization. In addition, our ability to generate revenue would be negatively affected if the size of our addressable patient population is not as significant as we estimate, an indication approved by regulatory authorities is narrower than we expect, or the patient population for treatment is narrowed by competition, physician choice, coverage or reimbursement, or payor or treatment guidelines. Even though we generate product revenue from Auryxia and may generate revenues from the sale of products and any product candidates that may be approved in the future, including those that may be in-licensed or acquired, we may never generate revenue that is significant enough to become and remain profitable, and we may need to obtain additional funding to continue operations.

We will require substantial additional financing to achieve our goals. A failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.

As of December 31, 2019, our cash and cash equivalents and available for sale securities were \$147.7 million. We expect to continue to expend substantial amounts for the foreseeable future continuing the commercialization of Auryxia and developing and commercializing vadadustat, if approved, and any other products or product candidates, including those that may be in-licensed or acquired. These expenditures will include costs associated with research and development, potentially obtaining marketing approvals and having our products manufactured, as well as marketing and selling products approved for sale, if any. In addition, other unanticipated costs may arise, including as a result of our decision to include certain elements in our development programs. Because the outcome of our current and anticipated clinical trials is highly uncertain, we cannot reasonably estimate the actual amount of funding necessary to successfully complete the development and commercialization of our product candidates. Our future capital requirements depend on many factors, including:

- significant costs associated with our global Phase 3 development program for vadadustat for the treatment of anemia due to CKD. As of December 31, 2019, we expect the remaining external aggregate contract research organization, or CRO, costs of PRO₂TECT and INNO₂VATE, which have enrolled 7,436 patients, to be in the range of \$80.0 million to \$100.0 million; the estimated costs for PRO₂TECT and INNO₂VATE could increase significantly due to a number of factors, including detection of unexpected safety signals, modification of clinical trial protocols, performing other studies in support of the Phase 3 program, choosing to add third party vendors to support the program, and any other factor that could delay completion of PRO₂TECT and INNO₂VATE;
- the cost and timing of commercialization activities for Auryxia, vadadustat and any other products or product candidates, including those that may be in-licensed or acquired, if approved for marketing, including product manufacturing, marketing, sales and distribution costs;
- the results of our meetings with the FDA, the EMA and other regulatory authorities and any consequential effects, including on study design, study size and resulting operating costs;
- difficulties or delays in enrolling patients in our clinical trials;
- the timing of, and the costs involved in obtaining, and, if approved, maintaining marketing approvals for vadadustat and any other product candidates that we may develop or acquire, including to fund the preparation and filing of regulatory submissions with the FDA, the EMA and other regulatory authorities, if clinical studies are successful, and the costs of maintaining marketing approvals for Auryxia or any other product, including those that may be in-licensed or acquired;
- the cost of conducting clinical studies or any post-marketing approval studies, Phase 4 studies or any other clinical trials for Auryxia;
- the outcome of our efforts to obtain marketing approval for vadadustat in the United States, Europe and in other jurisdictions and any other product candidates, including those that may be in-licensed or acquired;
- the scope, progress, results and costs of additional preclinical, clinical, or other studies for vadadustat and Auryxia, as well as any studies of any other products or product candidates, including those that may be in-licensed or acquired;
- the cost of securing and validating commercial manufacturing of vadadustat and any other product candidates, including those that may be in-licensed or acquired, and maintaining our manufacturing arrangements for Auryxia or any other products, including those that may be in-licensed or acquired, or securing and validating additional arrangements;
- the costs involved in preparing, filing and prosecuting patent applications and maintaining, defending and enforcing our intellectual property rights, including litigation costs, and the outcome of such litigation;
- the costs involved in any legal proceedings to which we are a party;
- Merger-related integration costs;
- our ability to attract, hire and retain qualified personnel; and
- the extent to which we engage in transactions, including collaboration, merger, acquisition and licensing transactions, pursuant to which we would develop and market commercial products, or develop other product candidates and technologies.

Furthermore, we expect to continue to incur additional costs associated with operating as a larger company following the Merger and as a public company, including any additional infrastructure and resources necessary to support the transition from our prior status as an emerging growth company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

We expect our cash resources and the receipt of a \$15.0 million regulatory milestone from MTPC, assuming approval of vadadustat in Japan, to fund our current operating plan well into 2021. We have based these estimates on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Furthermore, our development milestones may not be achieved, we may not receive the anticipated funding from our collaboration partners, and we may not secure other sources of financing. If and until we can generate a sufficient amount of product revenues, we expect to finance future cash needs through public or private equity or debt transactions, payments from our collaborators, royalty transactions, strategic transactions, or a combination of these approaches. Even if we believe we have sufficient funds for our current or future operating plans, we may seek additional capital if market conditions are favorable or if we have specific strategic objectives.

Any additional fundraising efforts may divert our management's attention away from their day-to-day activities, which may adversely affect our ability to develop and commercialize Auryxia, vadadustat and any other products or product candidates. Also, additional funds may not be available to us in sufficient amounts or on acceptable terms or at all. If we are unable to raise additional capital in sufficient amounts when needed or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of Auryxia, vadadustat and any other products or product candidates. Any of these events could significantly harm our business, financial condition and prospects.

Our obligations in connection with the Loan Agreement with Pharmakon could adversely affect our financial condition and restrict our operations.

We entered into a loan agreement, or the Loan Agreement, with Pharmakon, pursuant to which term loans in an aggregate principal amount of \$100.0 million, or the Term Loans, were made available to us in two tranches. The first tranche of \$80 million closed on November 25, 2019, and we have the option to draw down the second tranche of \$20.0 million on or before December 31, 2020, subject to the satisfaction of customary conditions. See Note 11 to our consolidated financial statements in Part II, Item 8 – Financial Statements and Supplementary Data for additional information regarding our obligations under the Loan Agreement. Our Loan Agreement with Pharmakon contains affirmative and negative covenants applicable to us and our subsidiaries, including maintaining, on an annual basis, a minimum liquidity threshold starting in 2021, and on a quarterly basis, a minimum net sales threshold for Auryxia starting in the fourth quarter of 2020. Failure to maintain compliance with these covenants could result in an event of default under the Loan Agreement.

In the event there is an acceleration of our and certain of our subsidiaries' liabilities under the Loan Agreement as a result of an event of default, we may not have sufficient funds or may be unable to arrange for additional financing to repay the liabilities or to make any accelerated payments, and Pharmakon could seek to enforce security interests in the collateral securing the Loan Agreement and Keryx's guarantee of the Term Loans, which could have a material adverse effect on our business, financial condition and results of operations.

The Loan Agreement permits voluntary prepayment at any time in whole or in part, subject to prepayment premiums and make-whole premiums prior to certain dates. Upon a change of control, mandatory prepayment provisions require us to prepay the principal amount outstanding, the applicable prepayment premium and make-whole premium and accrued and unpaid interest. In addition, our obligations in connection with the Loan Agreement could have additional significant adverse consequences, including, among other things:

- restricting our activities, including limitations on transferring certain of our assets, engaging in certain transactions, incurring certain additional indebtedness, creating certain liens, paying dividends or making certain other distributions and making certain investments;
- limiting our flexibility in planning for, or reacting to, changes in our business and our industry;
- placing us at a competitive disadvantage compared to our competitors who have a smaller amount of debt or competitors with comparable debt at more favorable interest rates; and
- limiting our ability to borrow additional amounts for working capital, capital expenditures, research and development efforts, acquisitions, debt service requirements, execution of our business strategy and other purposes.

Any of these factors could materially and adversely affect our business, financial condition and results of operations.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our product and product candidates on unfavorable terms to us.

We expect to finance our cash needs through product revenues, public or private equity or debt transactions, payments from our collaborators, royalty transactions, strategic transactions, or a combination of these approaches. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common stockholders will be diluted, our fixed payment obligations may increase, any such securities may have rights senior to those of our common stock, and the terms may include liquidation or other preferences and anti-dilution protections that adversely affect the rights of our common stockholders. Debt financing, if available, may involve agreements that would restrict our operations and potentially impair our competitiveness, such as limitations on our ability to incur additional debt, make capital expenditures, declare dividends, acquire, sell or license intellectual property rights, and other operating restrictions that could adversely impact our ability to conduct our business. If we raise additional funds through royalty transactions, we may have to relinquish valuable rights to our portfolio and future revenue streams, and enter into agreements that would restrict our operations and strategic flexibility. If we raise additional funds through strategic transactions with third parties, we may have to do so at an earlier stage than otherwise would be desirable. In connection with any such strategic transactions, we may be required to relinquish valuable rights to our product and product candidates, future revenue streams or research programs or grant licenses on terms that are not favorable to us. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our product development or commercialization efforts for Auryxia, vadadustat, or any other products or product candidates that we develop or acquire, or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

We may engage in strategic transactions to acquire assets, businesses, or rights to products, product candidates or technologies or form collaborations or make investments in other companies or technologies that could harm our operating results, dilute our stockholders' ownership, increase our debt, or cause us to incur significant expense.

As part of our business strategy, we may engage in additional strategic transactions to expand and diversify our portfolio, including through the acquisition of assets, businesses, or rights to products, product candidates or technologies or through strategic alliances or collaborations, similar to the Merger and our collaboration and license arrangements. We may not identify suitable strategic transactions, or complete such transactions in a timely manner, on a cost-effective basis, or at all. Moreover, we may devote resources to potential opportunities that are never completed or we may incorrectly judge the value or worth of such opportunities. Even if we successfully execute a strategic transaction, we may not be able to realize the anticipated benefits of such transaction, may incur additional debt or assume unknown or contingent liabilities in connection therewith, and may experience losses related to our investments in such transactions. Integration of an acquired company or assets into our existing business may not be successful and may disrupt ongoing operations, require the hiring of additional personnel and the implementation of additional internal systems and infrastructure, and require management resources that would otherwise focus on developing our existing business. Even if we are able to achieve the long-term benefits of a strategic transaction, our expenses and short-term costs may increase materially and adversely affect our liquidity. Any of the foregoing could have a detrimental effect on our business, results of operations and financial condition.

In addition, future transactions may entail numerous operational, financial and legal risks, including:

- incurrence of substantial debt, dilutive issuances of securities or depletion of cash to pay for acquisitions;
- exposure to known and unknown liabilities, including possible intellectual property infringement claims, violations of laws, tax liabilities and commercial disputes;
- higher than expected acquisition and integration costs;
- difficulty in integrating operations and personnel of any acquired business;
- increased amortization expenses or, in the event that we write-down the value of acquired assets, impairment losses;
- impairment of relationships with key suppliers or customers of any acquired business due to changes in management and ownership;
- inability to retain personnel, customers, distributors, vendors and other business partners integral to an in-licensed or acquired product, product candidate or technology;
- potential failure of the due diligence processes to identify significant problems, liabilities or other shortcomings or challenges;
- entry into indications or markets in which we have no or limited direct prior development or commercial experience and where competitors in such markets have stronger market positions; and
- other challenges associated with managing an increasingly diversified business.

If we are unable to successfully manage any transaction in which we may engage, our ability to develop new products and continue to expand and diversify our portfolio may be limited.

Risks Related to our Merger with Keryx

We may fail to realize the anticipated benefits of our merger with Keryx, those benefits may take longer to realize than expected, and we may encounter significant integration difficulties and liabilities, which may have a material adverse effect on our business and financial position.

On December 12, 2018, we completed the Merger. There can be no assurance that we will realize the full benefit of the anticipated synergies and cost savings relating to the Merger or that these benefits will be realized within the expected time frames or at all. Our ability to realize the anticipated benefits of the Merger will depend, to a large extent, on our ability to continue to integrate our business and Keryx's business and realize anticipated growth opportunities and synergies. If we are unable to successfully integrate the businesses, or integrate them in a timely fashion, we may face material adverse effects including, but not limited to (i) diversion of the attention of management and key personnel and potential disruption of our ongoing business, (ii) the loss of employees, (iii) challenges of managing a larger company, including challenges of conforming standards, controls, procedures and accounting and other policies and compensation structures, (iv) difficulties in achieving anticipated cost savings, (v) declines in our results of operations, financial condition or cash flows, (vi) a decline in the market price of our common stock, and (vii) potential liabilities, adverse consequences, increased expenses or other problems associated with our company following completion of the Merger. Many of these factors are outside of our control, and any one of them could result in increased costs, decreased expected revenues and further diversion of management time and energy, which could materially impact our business, financial statements and prospects.

In addition, following the Merger, we have become responsible for Keryx's liabilities and obligations, including with respect to legal, financial, regulatory and compliance matters, including certain post-approval regulatory requirements with respect to Auryxia and obligations under collaboration, license, supply and manufacturing agreements. These obligations will result in additional cost and investment by us and, if we have underestimated the amount of these costs and investments or if we fail to satisfy any such obligations, we may not realize the anticipated benefits of the transaction. Also, due to the Merger and ongoing integration, we may forego or delay pursuit of other opportunities that may have proven to have greater commercial potential.

Further, it is possible that there may be unknown, contingent or other liabilities or problems that may arise in the future, the existence and/or magnitude of which we were previously unaware. Any such liabilities or problems could have an adverse effect on our business, financial condition or results of operations.

Lawsuits have been filed challenging the Merger and additional lawsuits may be filed in the future. Any monetary damages, or other adverse judgment could have a material adverse effect on us.

There is an ongoing putative class action lawsuit filed by purported Keryx shareholders challenging the disclosures made in connection with the Merger. In addition, a stockholder of Keryx filed a complaint against Keryx pursuant to Section 220 of the Delaware General Corporation Law, which sought inspection of various Keryx books and records, purportedly to investigate "possible wrongdoing," in connection with Keryx's negotiation and approval of the Merger, as well as the independence of former members of Keryx's Board of Directors (some of whom are current members of our Board of Directors). See Part I, Item 3. Legal Proceedings for further information relating to the lawsuits. Additional lawsuits arising out of the Merger may be filed in the future. We could be forced to expend significant resources in the defense of these lawsuits, including but not limited to, costs associated with the indemnification of Keryx and Akebia directors and officers, and the lawsuits, regardless of outcome, could have a negative effect on our reputation, stock price and results of operations. In addition, monetary damages or other adverse judgment would have a material adverse effect on our business and financial position.

Our financial statements include goodwill and other intangible assets as a result of the Merger. These assets could become impaired in the future under certain conditions.

The Merger added approximately \$384.7 million of goodwill and definite lived intangible assets to our financial statements as of December 12, 2018. Our definite lived intangible assets are amortized over their estimated useful lives. In accordance with generally accepted accounting principles, or GAAP, we are required annually, or more frequently upon certain indicators of impairment, to review our estimates and assumptions underlying the fair value of our goodwill and our definite lived intangible assets when indicators of impairment are present. Conditions that could indicate impairment and necessitate such a review include, but are not limited to, Auryxia's commercial performance, our inability to execute on our strategic initiatives, and the deterioration of our market capitalization such that it is significantly below our net book value. To the extent we conclude that goodwill and/or definite lived intangible assets have become impaired, we may be required to incur material write-offs relating to such impairment and any such write-offs could have a material impact on our future operating results and financial position.

Risks Related to Commercialization

Our ability to successfully commercialize our product, Auryxia, our late-stage product candidate, vadadustat, if approved, and any other product or product candidate, including our ability to achieve their widespread market acceptance, is critical to the success of our business.

Our ability to generate significant product revenue will depend almost entirely on our ability to execute on our commercialization plans, the level of market adoption for, and the availability of and continued use of our product, Auryxia, and, if approved, our late-stage product candidate, vadadustat, by physicians, hospitals, dialysis clinics, wholesalers, patients, and/or healthcare payors, including government payors, consumers, managed care organizations, pharmacy benefit managers, and pharmacies. If we are not successful in commercializing Auryxia and vadadustat, if approved, including achieving and maintaining an adequate level of market adoption, our profitability and our future business prospects will be adversely impacted. Market acceptance of Auryxia and any other product or product candidate that may be approved, including vadadustat, depends on a number of other factors, including:

- the availability of adequate coverage and reimbursement by third party payors and governmental authorities;
- the safety and efficacy of the product, as demonstrated in clinical trials and in the post-marketing setting;
- the prevalence and complications of the disease treated by our product;
- the clinical indications for which the product is approved and the product label approved by regulatory authorities, including any warnings or limitations that may be required on the label as a consequence of potential safety risks associated with the product;
- the countries in which marketing approvals are obtained;
- the claims we and our collaborators are able to make regarding the safety and efficacy of the product;
- the success of our physician and patient communications and education programs;
- acceptance by physicians and patients of the product as a safe and effective treatment and the willingness of the target patient population to try new therapies and of physicians to prescribe new therapies;
- the cost, safety and efficacy of the product in relation to alternative treatments;
- the timing of receipt of marketing approvals and product launch relative to competing products and potential generic entrants;
- relative convenience and ease of administration;
- the prevalence and severity of adverse side effects;
- adverse publicity about our products or favorable or adverse publicity about competing products;
- the availability of discounts, rebates, and price concessions;
- the effectiveness of our and our collaborators' sales, marketing and distribution efforts; and
- the restrictions on the use of the product together with other medications, if any.

Market acceptance is critical to our ability to generate significant product revenue. In addition, any product or product candidate, if approved and commercialized, may achieve only limited market acceptance or none at all. If any of our approved products is not accepted by the market to the extent that we expect, we may not be able to generate product revenue and our business would suffer.

Generic competitors are seeking approval of generic versions of Auryxia and the market entry of one or more generic competitors would limit Auryxia sales and have an adverse impact on our business and results of operation.

Although composition and use of Auryxia are currently claimed by 15 issued patents that are listed in the FDA's Orange Book, we cannot assure that we will be successful in defending against third parties attempting to invalidate or design around our patents or assert that our patents are invalid or otherwise unenforceable or not infringed, or in competing against third parties introducing generic equivalents of Auryxia or any of our future products.

The Hatch-Waxman Act allows applicants seeking to market a generic equivalent of a drug that relies, in whole or in part, on the FDA's prior approval of a patented brand name drug, to provide notice to the holder of the New Drug Application, or NDA, for the brand name drug of its application, called a Paragraph IV certification notice, if the applicant is seeking to market its product prior to the expiration of the patents with claims directed to the brand name drug. After the introduction of a generic competitor, a significant percentage of the prescriptions written for a product may be filled with the generic version, resulting in a loss in sales of the branded product. We have received Paragraph IV certification notice letters regarding Abbreviated New Drug Applications, or ANDAs, submitted to the FDA requesting approval for generic versions of Auryxia tablets (210 mg iron per tablet), have filed certain complaints for patent infringement relating to such ANDAs, and have entered into a settlement and license agreement with one such ANDA filer. See Part I, Item 3. Legal Proceedings for further information relating to the ANDAs, lawsuits and settlements. Generic competition for Auryxia or any of our future products could have a material adverse effect on our sales, results of operations and financial condition.

In addition, litigation to enforce or defend intellectual property rights is complex, costly and involves significant management time. If our Orange Book listed patents are successfully challenged by a third party and a generic version of Auryxia is approved and launched, revenue from Auryxia could decline significantly, which would have a material adverse effect on our sales, results of operations and financial condition.

If we are unable to maintain sales, marketing and distribution capabilities or to enter into additional agreements with third parties, we may not be successful in commercializing Auryxia, vadadustat or any other products or product candidates, if approved.

In order to market Auryxia, we intend to continue to invest in sales and marketing, which will require substantial effort and significant management and financial resources. We will need to devote significant effort, in particular, to recruiting individuals with experience in the sales and marketing of pharmaceutical products. Competition for personnel with these skills is significant.

There are risks involved with maintaining our own sales, marketing and distribution capabilities, including the following:

- potential inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- potential inability of sales personnel to obtain access to physicians;
- potential lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines; and
- costs and expenses associated with maintaining our own sales and marketing organization.

If we are unable to maintain our own sales, marketing and distribution capabilities and our arrangements with third parties with respect to sales, marketing and distribution, or we are unsuccessful in entering into additional arrangements with third parties to sell, market and distribute or are unable to do so on terms that are favorable to us, we will not be successful in commercializing Auryxia, vadadustat, or any other product or product candidates.

Coverage and reimbursement may be limited or unavailable in certain market segments for Auryxia, vadadustat or any other products or product candidates, if approved, which could make it difficult for us to sell any approved products profitably.

Market acceptance and sales of any approved products depends significantly on the availability of adequate coverage and reimbursement from third party payors and may be affected by existing and future healthcare reform measures. Government authorities, third party payors, and pharmacy benefit managers, or PBMs, decide which drugs they will cover, as well as establish formularies or implement other mechanisms to manage utilization of products and determine reimbursement levels. Coverage and reimbursement by a third-party payor or PBM may depend upon a number of factors, including the determination that use of a product is:

- a covered benefit under the health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient; and
- cost effective.

Obtaining coverage and reimbursement approval for a product from a government or other third-party payor is a time consuming and costly process that could require us to provide supporting scientific, clinical and cost-effectiveness data for the use of our products to the payor. In the United States, there are multiple government and private third-party payors with varying coverage and reimbursement levels for pharmaceutical products, and the timing of commencement of reimbursement by a government payor is dependent on the assignment of codes via the Healthcare Common Procedure Coding System, which codes are assigned on a quarterly basis. Within Medicare, for oral drugs dispensed by pharmacies and also administered in facilities, coverage and reimbursement may vary depending on the setting. The Centers for Medicare & Medicaid Services, or CMS, local Medicare administrative contractors, Medicare Part D plans and/or PBMs operating on behalf of Medicare Part D plans, may have some responsibility for determining the medical necessity of such drugs, and therefore coverage, for different patients. Different reimbursement methodologies may apply, and CMS may have some discretion in interpreting their application in certain settings.

As an oral drug, Auryxia is covered by Medicare only under Part D. In September 2018, CMS communicated to Medicare Part D sponsors that CMS does not consider Auryxia to be covered under Part D when it is used solely for the treatment of iron deficiency anemia in patients with CKD not on dialysis, or the IDA Indication. CMS does, however, consider Auryxia to be a covered Part D drug when it is used for its other FDA-approved indication, the control of serum phosphorus levels in CKD patients on dialysis, or the Hyperphosphatemia Indication. As a result, Part D sponsors require a prior authorization for all Auryxia prescriptions for Medicare beneficiaries to ensure that Auryxia is being used for the Part D covered indication. On October 15, 2019, we filed a complaint in the United States District Court for the District of Massachusetts against CMS and the U.S. Department of Health and Human Services, or HHS, challenging CMS's decision that Auryxia would no longer be covered by Medicare for the IDA Indication and CMS's related decision that imposed the prior authorization requirement for Auryxia in the Hyperphosphatemia Indication. On February 4, 2020, the court denied our request for a preliminary injunction. We filed an expedited appeal with the Court of Appeals for the First Circuit challenging the district court's denial of our motion for a preliminary injunction. The appeal is currently pending. If we are unsuccessful in our efforts to obtain Part D coverage for the IDA Indication, our ability to commercialize Auryxia for this indication will continue to be adversely impacted. While we believe that the vast majority of the Part D prescriptions written for Auryxia today are for the Hyperphosphatemia Indication and therefore will continue to be covered by Part D plans with prior authorization, the prior authorization requirement and the CMS decision have had and may continue to have an adverse impact on market acceptance of Auryxia, sales of Auryxia for the Hyperphosphatemia Indication and the IDA Indication, respectively, and ultimately on the timing and number of prescriptions and Auryxia product revenue, and may influence physicians' prescribing decisions. Sales of Auryxia for the Hyperphosphatemia Indication and the IDA Indication have been negatively impacted, and may continue to be negatively affected, as a result of the CMS decision. Even if we are successful in overturning the CMS decision, the negative impact that the original decision had on the growth of sales of Auryxia for the Hyperphosphatemia Indication and the IDA Indication will continue, although less significantly than if the CMS decision is not overturned. We cannot predict the future impact of the CMS determination or prior authorization changes on our operations and they could have a material adverse effect on our revenue and results of operations going forward.

Medicaid reimbursement of drugs will also vary by state. Private third-party payor reimbursement policies may also vary and may or may not be consistent with Medicare reimbursement methodologies. Manufacturers of outpatient prescription drugs may be required to provide discounts or rebates under government healthcare programs or to certain third-party payors in order to obtain coverage of such products.

Additionally, we may be required to enter into contracts with third party payors and/or PBMs offering rebates or discounts on our products in order to obtain favorable formulary status. We may not be able to agree upon commercially reasonable terms with such third party payors or PBMs, or provide data sufficient to obtain favorable coverage and reimbursement for many reasons, including that we may be at a competitive disadvantage relative to companies with more extensive product lines. In addition, third party payors, PBMs and other entities that purchase our products may impose restrictions on our ability to raise prices for our products over time without incurring additional costs. We cannot be sure that coverage or adequate reimbursement will be available for our product or any of our potential future products. Even if we obtain coverage for any approved product, third party payors may not establish adequate reimbursement amounts which may reduce the demand for our product and prompt us to have to reduce pricing for the product. If reimbursement is not available or is limited, we may not be able to commercialize certain of our products.

If we are unable to obtain or maintain contracts with key distribution partners, our business could be materially harmed.

As disclosed in this Annual Report on Form 10-K for the year ended December 31, 2019, we had four distributors, Fresenius Medical Care Rx, McKesson Corporation, Cardinal Health, Inc. and Amerisource Bergen Drug Corporation, that, in the aggregate, accounted for a significant percentage of our gross accounts receivable as of December 31, 2019. If we are not able to maintain our contracts with these key distributors on favorable terms, on a timely basis or at all, or if there is any adverse change in one or more of these distributors' business practices or financial condition, or such distributors' end users' prescribing practices or clinical protocols, it would adversely impact the market opportunity for Auryxia, our product revenues and operating results.

Further, if vadadustat is approved and included in the fixed reimbursement model for a bundle of dialysis services, or the bundle, we would be required to enter into contracts to supply vadadustat to specific dialysis providers, instead of through distributors, which we believe could be challenging. The dialysis market is unique and is dominated by two providers: DaVita, Inc., or DaVita, and Fresenius Medical Care, or Fresenius, which account for a vast majority of the dialysis population in the United States. In May 2017, we entered into a license agreement, which was amended and restated in April 2019, pursuant to which we granted Vifor (International) Ltd., or Vifor Pharma, an exclusive license to sell vadadustat to Fresenius Kidney Care Group LLC, or FKC, and certain third party dialysis organizations, or the Third Party Dialysis Organizations, approved by us, in the United States. The license would be effective upon the following: FDA approval of vadadustat for anemia due to CKD in adult patients with the dialysis-dependent CKD, the earlier of CMS's determination that vadadustat will be reimbursed using the Transitional Drug Add-On Payment Adjustment, or the TDAPA, and inclusion in a bundled reimbursement model, and a milestone payment by Vifor Pharma. Under this amended license agreement with Vifor Pharma, or the Vifor Agreement, FKC and the Third Party Dialysis Organizations are not obligated to utilize vadadustat in its clinics. In addition, even if FKC and the Third Party Dialysis Organizations choose to utilize vadadustat in their clinics in the United States, they are not restricted from utilizing other therapies for anemia due to CKD. The Vifor Agreement restricts us from directly supplying vadadustat to FKC or any other affiliate of Fresenius Medical Care North America and the Third Party Dialysis Organizations. The Vifor Agreement does not restrict us from entering into supply agreements with other dialysis clinics, such as DaVita; however, these dialysis clinics may choose not to contract with us for vadadustat or they may choose to contract with us for a limited supply of vadadustat. If vadadustat is approved and we are not able to maintain the Vifor Agreement or enter into a supply agreement with DaVita, our business may be materially harmed.

Although we currently believe it is likely that vadadustat, if approved, will be reimbursed using the TDAPA followed by reimbursement via the bundled reimbursement model, if vadadustat is neither reimbursed under the TDAPA nor the bundled reimbursement model, then the Vifor Agreement will not become effective, and patients would access vadadustat through contracts we negotiate with third party payors for reimbursement of vadadustat, which would be subject to the risks and uncertainties described above. Additionally, if there are updates to the TDAPA rule that decrease the basis for reimbursement or eligibility criteria during the transition period or if the TDAPA is eliminated, then our profitability may be adversely affected.

In addition, we may be unable to sell vadadustat, if approved, to dialysis providers on a profitable basis if CMS significantly reduces the level of reimbursement for dialysis services and providers choose to use alternative therapies or look to negotiate their contracts with us. Our profitability may also be affected if our costs of production increase faster than increases in reimbursement levels. Adequate coverage and reimbursement of our products by government and private insurance plans are central to patient and provider acceptance of any products for which we receive marketing approval.

The successful commercialization of Auryxia, vadadustat or any other products or product candidates, if approved, will depend in part on the extent to which third party payors and government authorities establish adequate reimbursement levels and pricing policies.

Third party payors are increasingly attempting to contain healthcare costs by limiting both coverage and reimbursement levels for new drugs. As a result, significant uncertainty exists as to whether and how much reimbursement third party payors will provide for newly approved drugs which, in turn, will put downward pressure on the pricing of drugs. Cost control initiatives may decrease coverage and payment levels for any drug and, in turn, the price that we will be able to charge and/or the volume of our sales. Certain third party payors require prior authorization for, or even refuse to provide, reimbursement for Auryxia, and others may do so in the future with respect to Auryxia, vadadustat and any of our other products or product candidates. In addition, certain third party payors require some form of prior authorization for the administration of ESAs for the treatment of anemia due to CKD within the non-dialysis patient population, and a similar prior authorization may be applicable to the HIF-PHI class for the treatment of anemia due to CKD within the non-dialysis patient population. Our business would be materially adversely affected if we are not able to receive approval for reimbursement from third party payors on a broad, timely or satisfactory basis; if reimbursement is subject to overly broad or restrictive prior authorization requirements; or if reimbursement is not maintained at satisfactory levels or becomes subject to prior authorization. We are unable to predict all changes to the coverage or reimbursement methodologies that will be applied by private or government payors.

In addition, in some countries, including member states of the European Union, or EU, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take a significant amount of time after receipt of marketing approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various EU member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices, and in certain instances render commercialization in certain markets infeasible or disadvantageous from a financial perspective. In some countries, we or our collaborators may be required to conduct a clinical trial or other studies that compare the cost-effectiveness of our product and/or our product candidates to other available products in order to obtain or maintain reimbursement or pricing approval. Publication of discounts by third party payors or government authorities may lead to further pressure on the prices or reimbursement levels. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, the commercial launch of our product and/or product candidates could be delayed, possibly for lengthy periods of time, we or our collaborators may not launch at all in a particular country, we may not be able to recoup our investment in one or more product candidates, and there could be a material adverse effect on our business.

Recently, there has been considerable public and government scrutiny in the United States of pharmaceutical pricing and proposals to address the perceived high cost of pharmaceuticals. There have also been several recent state legislative efforts to address drug costs, which generally have focused on increasing transparency around drug costs or limiting drug prices or price increases. Adoption of new legislation at the federal or state level could affect demand for, or pricing of, our product candidates, if approved, and could diminish our ability to establish what we believe is a fair price for our products, ultimately diminishing our revenue for our products if they are approved.

We face substantial competition, which may result in others discovering, developing or commercializing products before, or more successfully than, we do.

The development and commercialization of new drugs is highly competitive and subject to rapid and significant technological change. Our future success depends on our ability to demonstrate and maintain a competitive advantage with respect to the development and commercialization of our product and product candidates. Our objective is to continue to commercialize Auryxia and develop and commercialize new products with superior efficacy, convenience, tolerability and/or safety. In many cases, any approved products that we commercialize will compete with existing, market-leading products.

Auryxia is competing in the hyperphosphatemia market in the United States with other FDA-approved phosphate binders such as Renagel® (sevelamer hydrochloride) and Renvela® (sevelamer carbonate), both marketed by Genzyme Corporation (a wholly-owned subsidiary of Sanofi), PhosLo® and Phoslyra® (calcium acetate), marketed by Fresenius Medical Care North America, Fosrenol® (lanthanum carbonate), marketed by Shire Pharmaceuticals Group plc, and Velphoro® (sucroferric oxyhydroxide), marketed by Fresenius Medical Care North America, as well as over-the-counter calcium carbonate products such as TUMS® and metal-based options such as aluminum, lanthanum and magnesium. Most of the phosphate binders listed above are now also available in generic forms. In addition, other agents are in development, including OPKO Health Inc.'s Alpharen™ Tablets (fermagate tablets) and Ardelyx, Inc.'s tenapanor, that may impact the market for Auryxia.

Auryxia is competing in the IDA market in the United States with over-the-counter oral iron, ferrous sulfate, other prescription oral iron formulations, including ferrous gluconate, ferrous fumarate, and polysaccharide iron complex, and IV iron formulations, including Feraheme® (ferumoxytol injection), Venofer® (iron sucrose injection), Ferrlicit® (sodium ferric gluconate complex in sucrose injection), Injectafer® (ferric carboxymaltose injection), and Triferic® (ferric pyrophosphate citrate).

In addition, other new therapies for the treatment of IDA may impact the market for Auryxia, such as Shield Therapeutics' Feraccru® (ferric maltol), which is available in Europe for IDA and Accrufer® (ferric maltol), which is approved in the United States for IDA.

Furthermore, Auryxia's commercial opportunities may be reduced or eliminated if our competitors develop and market products that are less expensive, more effective or safer than Auryxia. Other companies have product candidates in various stages of pre-clinical or clinical development to treat diseases and complications of the diseases for which we are marketing Auryxia.

If vadadustat is approved and launched commercially, competing drugs may include EPOGEN® (epoetin alfa) and Aranesp® (darbepoetin alfa), both commercialized by Amgen, Procrit® (epoetin alfa) and Eprex® (epoetin alfa), commercialized by Johnson & Johnson in the United States and Europe, respectively, and Mircera® (methoxy PEG-epoetin beta), commercialized by Vifor Pharma in the United States and Roche Holding Ltd. outside the United States. We may also face competition from potential new anemia therapies. There are several other HIF-PHI product candidates in various stages of development for anemia indications that may be in direct competition with vadadustat, if and when they are approved and launched commercially. These candidates are being developed by such companies as FibroGen, Japan Tobacco International, GlaxoSmithKline plc and Bayer HealthCare AG. FibroGen, together with its collaboration partners, Astellas Pharma Inc. and AstraZeneca PLC, is currently in global Phase 3 clinical development of its product candidate, roxadustat. The product has launched for the treatment of anemia of CKD in patients on dialysis, or DD-CKD, in Japan and both DD-CKD and for the treatment of anemia of CKD in patients not on dialysis, or NDD-CKD, in China. FibroGen announced that the FDA has completed its filing review of its NDA for roxadustat for both DD-CKD and NDD-CKD and set a Prescription Drug User Fee Act date of December 20, 2020. They have stated they expect Astellas to file a marketing authorization application in the European Union, or MAA, for both indications in the second quarter of 2020. GlaxoSmithKline plc is currently in global Phase 3 clinical development of its product candidate, daprodustat. Japan Tobacco International and Bayer HealthCare AG are currently in Phase 3 clinical development of their product candidates in Japan. GlaxoSmithKline plc and Japan Tobacco International have submitted NDAs for their product candidates for the treatment of renal anemia in Japan. In addition, certain companies are developing potential new therapies for renal-related diseases that could potentially reduce injectable ESA utilization and thus limit the market potential for vadadustat if they are approved and launched commercially. Other new therapies are in development for the treatment of conditions inclusive of renal anemia that may impact the market for anemia-targeted treatment.

A biosimilar is a biologic product that is approved based on demonstrating that it is highly similar to an existing, FDA-approved branded biologic product. The patents for the existing, branded biologic product must expire in a given market before biosimilars may enter that market without risk of being sued for patent infringement. In addition, an application for a biosimilar product cannot be approved by the FDA until 12 years after the existing, branded product was approved under a Biologics License Application, or BLA. The patents for epoetin alfa, an injectable ESA, expired in 2004 in the EU, and the remaining patents expired between 2012 and 2016 in the United States. Because injectable ESAs are biologic products, the introduction of biosimilars into the injectable ESA market in the United States will constitute additional competition for vadadustat if we are able to obtain approval for and commercially launch our product. Several biosimilar versions of injectable ESAs are available for sale in the EU. In the United States, Pfizer's biosimilar version of injectable ESAs, Retacrit® (epoetin alfa-epbx), was approved by the FDA in May 2018 and launched in November 2018.

Many of our potential competitors have significantly greater financial, manufacturing, marketing, drug development, technical and human resources than we do. Large pharmaceutical companies, in particular, have extensive experience in clinical testing, obtaining marketing approvals, recruiting patients and manufacturing pharmaceutical products. Large and established companies such as Amgen and Roche, among others, compete in the market for drug products to treat kidney disease. In particular, these companies have greater experience and expertise in conducting preclinical testing and clinical trials, obtaining marketing approvals, manufacturing such products on a broad scale and marketing approved products. These companies also have significantly greater research and marketing capabilities than we do and may also have products that have been approved or are in late stages of development, and have collaborative arrangements in our target markets with leading companies and research institutions. Established pharmaceutical companies may also invest heavily to accelerate discovery and development of novel compounds or to in-license novel compounds that could make the product candidates that we are developing obsolete. Smaller and other early stage companies may also prove to be significant competitors. As a result of all of these factors, our competitors may succeed in obtaining patent protection and/or marketing approval, or discovering, developing and commercializing competitive products, before, or more effectively than, we do. If we are not able to compete effectively against potential competitors, our business will not grow and our financial condition and operations will suffer.

The commercialization of Riona in Japan and our current and potential future efforts with respect to the development and commercialization of our products and product candidates outside of the United States subject us to a variety of risks associated with international operations, which could materially adversely affect our business.

Our Japanese sublicensee, Japan Tobacco, Inc., or JT, and its subsidiary, Torii Pharmaceutical Co., Ltd., or Torii, commercialize Riona, the trade name for ferric citrate hydrate in Japan, as an oral treatment for the improvement of hyperphosphatemia in patients with CKD, including DD-CKD and NDD-CKD in Japan. We also granted Otsuka Pharmaceutical Co. Ltd., or Otsuka, exclusive rights to commercialize vadadustat in Europe, China and certain other markets, subject to marketing approvals. In Japan and certain other countries in Asia, we granted Mitsubishi Tanabe Pharma Corporation, or MTPC, exclusive rights to commercialize vadadustat, subject to marketing approvals. We are also conducting our global Phase 3 development with respect to vadadustat for the treatment of anemia due to CKD, and MTPC is carrying out development efforts for vadadustat in Japan. In July 2019, MTPC submitted a Japanese New Drug Application, or JNDA, to the Ministry of Health, Labor and Welfare in Japan for manufacturing and marketing approval of vadadustat, as a treatment for anemia due to CKD. As a result of these and other activities, we are or may become subject to additional risks in developing and commercializing our product and product candidates outside the United States, including:

- political, regulatory, compliance and economic developments that could restrict our ability to manufacture, market and sell our products;
- changes in international medical reimbursement policies and programs;
- changes in healthcare policies of foreign jurisdictions;
- trade protection measures, including import or export licensing requirements and tariffs;
- our ability to develop relationships with qualified local distributors and trading companies;
- political and economic instability in particular foreign economies and markets;
- diminished protection of intellectual property in some countries outside of the United States;
- differing labor regulations and business practices;
- regulatory and compliance risks that relate to maintaining accurate information and control over sales and distributors' and service providers' activities that may fall within the purview of the U.S. Foreign Corrupt Practices Act, or FCPA, the UK Bribery Act or similar local regulation;
- compliance with the EU General Data Protection Regulation, or GDPR;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;

- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- potentially negative consequences from changes in or interpretations of tax laws;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism or natural disasters including earthquakes, typhoons, floods and fires.

Any of these factors may, individually or as a group, have a material adverse effect on our business and results of operations. As and if we continue to expand our commercialization efforts, we may encounter new risks.

Risks Related to the Clinical Development of Vadadustat and our Other Product Candidates

In addition to Auryxia, we will continue to depend heavily on the success of our product candidate, vadadustat, which is currently in Phase 3 development. Clinical drug development involves a lengthy and expensive process with an uncertain outcome. We will incur additional costs in connection with, and may experience delays in completing, or ultimately be unable to complete, the development and commercialization of vadadustat and any other product candidates.

The risk of failure in drug development is high. We currently have only one commercial product, Auryxia, and one product candidate, vadadustat, in clinical development, and we depend heavily on the successful commercialization of Auryxia and the successful clinical development, marketing approval and commercialization of vadadustat, which may never occur. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical development and conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. Clinical trials are expensive, difficult to design and implement, can take several years to complete, and their outcomes are inherently uncertain. Failure can occur at any time during the clinical trial process. Further, the results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their product candidates. It is impossible to predict when or if any of our product candidates will prove effective or safe in humans or will receive marketing approval.

We may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent our ability to receive or maintain marketing approval or commercialize our product candidates. Our clinical trials may take longer to complete than currently anticipated, or may be delayed, suspended, required to be repeated, prematurely terminated or may not successfully demonstrate safety and/or efficacy for a variety of other reasons, such as:

- the costs are greater than we anticipate;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate;
- enrollment in our clinical trials and accrual of major adverse cardiovascular events, or MACE, events may be slower than we anticipate, or participants may drop out of these clinical trials at a higher rate than we anticipate;
- our third party contractors, such as our CROs, may fail to comply with regulatory requirements, perform effectively, or meet their contractual obligations to us in a timely manner, or at all, or we may fail to communicate effectively or provide the appropriate level of oversight of such third party contractors;
- the supply or quality of our starting materials, drug substance and drug product necessary to conduct clinical trials of our product candidates may be insufficient or inadequate;
- regulators, independent data monitoring committees, or IDMCs, institutional review boards, or IRBs, safety committees, or ethics committees, may require that we suspend or terminate our clinical trials for various reasons, including noncompliance with regulatory requirements, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using our product candidate, or a finding that the participants are being exposed to unacceptable health risks;
- clinical trials of our product candidates may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials, repeat a clinical trial or abandon product development programs;

- lack of adequate funding to continue a clinical trial, including unforeseen costs due to enrollment delays, requirements to conduct additional clinical trials or repeat a clinical trial and increased expenses associated with the services of our CROs and other third parties;
- failure to initiate, delay of or failure to complete a clinical trial as a result of an Investigational New Drug application, or IND, being placed on clinical hold by the FDA, the EMA, the Japanese Pharmaceuticals and Medical Devices Agency, or PMDA, or other regulatory authorities, or for other reasons;
- we may determine to change or expand a clinical trial, including after it has begun;
- clinical trial sites and investigators deviating from the clinical protocol, failing to conduct the trial in accordance with regulatory requirements, or dropping out of a trial, or failure by us or our CROs to communicate effectively or provide the appropriate level of oversight of such clinical sites and investigators;
- delay or failure in having patients complete a clinical trial or return for post-treatment follow-up;
- delay or failure in recruiting and enrolling suitable patients to participate in a clinical trial;
- inability, delay, or failure in identifying and maintaining a sufficient number of clinical trial sites, many of which may already be engaged in other clinical programs;
- delay or failure in reaching agreement with the FDA, the EMA, the PMDA or other regulatory authorities on a clinical trial design upon which we are able to execute;
- delay or failure in obtaining authorization to commence a clinical trial or inability to comply with conditions imposed by a regulatory authority regarding the scope or design of a clinical trial;
- delays in reaching, or failure to reach, agreement on acceptable terms with prospective clinical trial sites and prospective CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical trial sites;
- the FDA, the EMA, the PMDA or other regulatory authorities may require us to submit additional data or impose further requirements before permitting us to initiate a clinical trial or during an ongoing clinical trial;
- the FDA, the EMA, the PMDA or other regulatory authorities may disagree with our clinical trial design and our interpretation of data from clinical trials, or may change the requirements for approval even after it has reviewed and commented on the design for our clinical trials;
- the design of our clinical trials;
- failure to comply with good practice quality guidelines and regulations, or GXP, including good laboratory practice, good clinical practice, or GCP, and current good manufacturing practice, or cGMP; or
- changes in governmental regulations or administrative actions.

If we are unable to successfully complete clinical trials of our product candidates or other studies, if the results of those trials and studies are not positive or are only modestly positive, or if there are concerns with the profile due to efficacy or safety, or if any of the factors listed above occur, the following may occur:

- regulators may require that we conduct additional clinical trials, repeat clinical trials or conduct other studies of our product candidates beyond those that we currently contemplate;
- we may be delayed in obtaining marketing approval for our product candidates;
- we may not obtain marketing approval for our product candidates at all;
- we may obtain approval for indications or patient populations that are not as broad as intended or desired;
- we may obtain approval with labeling that includes significant use or distribution restrictions or safety warnings that would reduce the potential market for our products or inhibit our ability to successfully commercialize our products;
- we may be subject to additional post-marketing restrictions and/or requirements; or
- the product may be removed from the market after obtaining marketing approval.

Our product development costs will also increase if we experience delays in preclinical and clinical development or receiving the requisite marketing approvals. Our preclinical studies or clinical trials may need to be restructured or may not be completed on schedule, or at all. Significant preclinical or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do. This could impair our ability to successfully commercialize our product candidates and may harm our business and results of operations.

We may find it difficult to enroll patients in our clinical studies, which could delay or prevent clinical studies of our product candidates.

Identifying and qualifying patients to participate in clinical studies of our product candidates is critical to our success. The timing of our clinical studies depends, in part, on the speed at which we can recruit patients to participate in testing our product candidates. Patients may be unwilling to participate in our clinical studies because of concerns about adverse events observed with the current standard of care, competitor products and/or other investigational agents, in each case for the same indications and/or similar patient populations. In addition, patients currently receiving treatment with the current standard of care or a competitor product may be reluctant to participate in a clinical trial with an investigational drug. Finally, competition for clinical trial sites may limit our access to patients appropriate for studies of vadadustat and any other product candidates. As a result, the timeline for recruiting patients and conducting studies may be delayed. These delays could result in increased costs, delays in advancing our development of our product candidates, or termination of the clinical studies altogether.

We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics, to complete our clinical studies in a timely manner. Patient enrollment is affected by many factors, including:

- severity of the disease under investigation;
- design of the study protocol;
- size and nature of the patient population;
- eligibility criteria for, and design of, the study in question;
- perceived risks and benefits of the product candidate under study, including as a result of adverse effects observed in similar or competing therapies;
- proximity and availability of clinical study sites for prospective patients;
- availability of competing therapies and clinical studies and clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to available therapies or other product candidates in development;
- efforts to facilitate timely enrollment in clinical studies;
- clinical trial sites and investigators failing to perform effectively;
- patient referral practices of physicians; and
- ability to monitor patients adequately during and after treatment.

We may not be able to initiate or continue clinical studies if we cannot enroll a sufficient number of eligible patients to participate in the clinical studies required by regulatory agencies. If we have difficulty enrolling a sufficient number of patients to conduct our clinical studies as planned, we may need to delay, limit or terminate ongoing or planned clinical studies, any of which could have a material adverse effect on our business.

We may not be able to conduct clinical trials in some jurisdictions outside of the United States.

We and our collaboration partners currently expect to seek marketing approval of vadadustat for the treatment of anemia due to CKD in markets outside the United States, including the EU, and our collaboration partner, MTPC, submitted a JNDA for vadadustat for the treatment of anemia due to CKD in July 2019 in Japan. Our ability to successfully initiate, enroll and complete a clinical study in any country outside of the United States is subject to numerous additional risks unique to conducting business in jurisdictions outside the United States, including:

- difficulty in establishing or managing relationships with qualified CROs, physicians and clinical trial sites;
- different local standards for the conduct of clinical studies;
- difficulty in complying with various and complex import laws and regulations when shipping drug to certain countries; and
- the potential burden of complying with a variety of laws, medical standards and regulatory requirements, including the regulation of pharmaceutical and biotechnology products and treatments.

Data obtained from studies conducted in the United States may not be accepted by the EMA, the PMDA and other regulatory authorities outside of the United States. Also, certain jurisdictions require data from studies conducted in their country in order to obtain approval in that country. For example, in Japan, MTPC conducted a Phase 3 program of vadadustat, which is separate from our global Phase 3 program of vadadustat.

If we or our collaboration partners have difficulty conducting our clinical studies in jurisdictions outside the United States as planned, we may need to delay, limit or terminate ongoing or planned clinical studies, any of which could have a material adverse effect on our business.

Positive results from preclinical and clinical studies are not necessarily predictive of the results of any future clinical studies.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. Success in preclinical studies may not be predictive of similar results in humans during clinical trials, successful results from early or small clinical trials may not be replicated in later and larger clinical trials, and successful interim results from ongoing clinical studies may not be indicative of results obtained when those studies are completed. For example, our encouraging preclinical and clinical results for vadadustat thus far do not ensure that the results of any future clinical trials will demonstrate similar results. Our global Phase 3 development program for vadadustat has enrolled a larger number of patients and will treat patients for longer periods than our prior trials, which will result in a greater likelihood that adverse events may be observed. Due to these and other differences between our global Phase 3 development program for vadadustat and our prior trials, our positive results from preclinical and clinical studies may not be replicated in our global Phase 3 development program for vadadustat. Many companies in the biopharmaceutical industry have suffered significant setbacks in late-stage clinical trials after achieving positive results in early stage development, and we may face similar setbacks. If the results of our ongoing or future clinical trials for vadadustat or any other product candidates are inconclusive with respect to efficacy, if we do not meet our clinical endpoints with statistical significance, or if there are safety concerns or adverse events, we may be prevented from or delayed in obtaining marketing approval for vadadustat or any other product candidates.

We may not be successful in our efforts to identify, acquire, discover, develop and commercialize additional products or product candidates, which could impair our ability to grow.

Although we continue to focus a substantial amount of our efforts on the commercialization of Auryxia and the development and potential commercialization of vadadustat, a key element of our long-term growth strategy is to acquire, develop and/or market additional products and product candidates. Research programs to identify product candidates require substantial technical, financial and human resources, regardless of whether product candidates are ultimately identified. Our research and development programs may initially show promise, yet fail to yield product candidates for clinical development or commercialization for many reasons, including the following:

- the research methodology used may not be successful in identifying potential indications and/or product candidates;
- we may not be able or willing to assemble sufficient resources to acquire or discover additional product candidates;
- a product candidate may be shown to have harmful side effects, a lack of efficacy or otherwise does not meet applicable regulatory criteria;
- product candidates we develop may nevertheless be covered by third party patents or other exclusive rights;
- the market for a product candidate may change during our program so that the continued development of that product candidate is no longer reasonable;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all; or
- a product candidate may not be accepted as safe and effective by patients, the medical community, or third party payors, if applicable.

If any of these events occurs, we may be forced to abandon our research and development efforts for one or more of our programs, or we may not be able to identify, discover, develop or commercialize additional product candidates, which would have a material adverse effect on our business.

Because we have limited financial and managerial resources, we focus on research programs and product candidates for specific indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential or a greater likelihood of success. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities.

Because our internal research capabilities are limited, we may be dependent upon other pharmaceutical and biotechnology companies, academic scientists, and other researchers to sell or license products or technology to us. The success of this strategy depends partly upon our ability to identify, select, and acquire promising product candidates and products. The process of proposing, negotiating and implementing a license or acquisition of a product candidate or an approved product is lengthy and complex. Other companies, including some with substantially greater financial, marketing and sales resources, may compete with us for the license or acquisition of a product candidate or an approved product. We have limited resources to identify and execute the acquisition or in-licensing of third party products, businesses, and technologies and integrate them into our current infrastructure.

Moreover, we may devote resources to potential acquisitions or in-licensing opportunities that are never completed, or we may fail to realize the anticipated benefits of such efforts, including, for example, with respect to the Merger. Any product candidate that we acquire may require additional development efforts prior to commercial sale, including extensive clinical testing and approval by the FDA, the EMA, the PMDA or other regulatory authorities, or post-approval testing or other requirements if approved. All product candidates are prone to risks of failure typical of pharmaceutical product development, including the possibility that a product candidate will not be shown to be sufficiently safe and effective for approval by regulatory authorities. In addition, we cannot provide assurance that any products that we develop or approved products that we acquire will be manufactured profitably, achieve market acceptance or not require substantial post-marketing clinical trials.

Accordingly, there can be no assurance that we will ever be able to identify additional therapeutic opportunities for our product candidates or to acquire or develop suitable potential product candidates or approved products, which could materially adversely affect our future growth and prospects. We may focus our efforts and resources on potential product candidates or other programs that ultimately prove to be unsuccessful.

Auryxia, vadadustat or any other products and product candidates may cause undesirable side effects or have other properties that delay or limit their commercial potential, or in the case of our product candidates, prevent their marketing approval.

Undesirable side effects caused by our product or product candidates or competing commercial products or product candidates in development that utilize a common mechanism of action could cause us or regulatory authorities to interrupt, delay or halt clinical trials, could result in a more restrictive label or the delay, denial or withdrawal of marketing approval by the FDA or other regulatory authorities, and could lead to potential product liability claims. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics.

If we or others identify undesirable side effects caused by Auryxia, vadadustat, or any other products or product candidates, either before or after receipt of marketing approval, a number of potentially significant negative consequences could result, including:

- our clinical trials may be put on hold;
- patient recruitment could be slowed, and enrolled patients may not want to complete the clinical trial;
- we may be unable to obtain marketing approval for our product candidates or regulatory authorities may withdraw approvals of products;
- regulatory authorities may require warnings on the label such as the warning on Auryxia's label regarding iron overload;
- Risk Evaluation and Mitigation Strategies, or REMS, or FDA-imposed risk management plans that use risk minimization strategies to ensure that the benefits of certain prescription drugs outweigh their risks, may be required;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining marketing approval and, ultimately, market acceptance of Auryxia, vadadustat or any other products or product candidates, could substantially increase our costs, and could significantly impact our ability to successfully commercialize Auryxia, vadadustat or any other products and product candidates and generate revenues.

The patient populations treated with Auryxia and the patients in our clinical studies for vadadustat have CKD, a serious disease that increases the risk of cardiovascular disease including heart attacks and stroke and, ultimately, may cause kidney failure. Many patients with CKD are elderly with comorbidities making them susceptible to significant health risks. Therefore, the likelihood of these patients having adverse events, including serious adverse events, while participating in our studies is high.

In our Phase 1 and Phase 2 studies of vadadustat, adverse events were reported. For example, in our Phase 2b study of vadadustat in non-dialysis patients with anemia due to CKD, one subject with multiple co-morbidities and concomitant medications, including chlorthalidone, had a serious adverse event of liver function test abnormal, considered a case of drug induced liver injury meeting the biochemical criteria of Hy's Law, which was assessed as probably related to vadadustat. Serious adverse events considered related to vadadustat and any other product candidates could have a material adverse effect on the development of such product candidates and our business as a whole. Our understanding of adverse events in prior clinical trials of our product candidates may change as we gather more information, and additional unexpected adverse events may be observed in future clinical trials.

The most commonly reported adverse reactions in the clinical trials that supported the approval of Auryxia for the Hyperphosphatemia Indication in the United States included diarrhea (21%), discolored feces (19%), nausea (11%), constipation (8%), vomiting (7%), and cough (6%). Gastrointestinal adverse reactions were the most common reason for discontinuing Auryxia (14%) in clinical trials for the Hyperphosphatemia Indication. The most commonly reported adverse reactions in the clinical trials that supported the approval of Auryxia in the United States for the IDA Indication included discolored feces (22%), diarrhea (21%), constipation (18%), nausea (10%), abdominal pain (5%) and hyperkalemia (5%). Diarrhea was the most common reason for discontinuing Auryxia (2.6%) in clinical trials for the IDA Indication.

Furthermore, any post-marketing clinical trials conducted, if successful, may expand the patient populations treated with Auryxia, or any other products we acquire or for which we receive marketing approval, within or outside of their current indications or patient populations, which could result in the identification of previously unknown side effects, increased frequency or severity of known side effects, or detection of unexpected safety signals. In addition, as Auryxia and any other products are commercialized, they will be used in larger patient populations and in less rigorously controlled environments than in clinical studies. As a result, regulatory authorities, healthcare practitioners, third party payors or patients may perceive or conclude that the use of Auryxia or any other products are associated with serious adverse effects, undermining our commercialization efforts.

Further, if we or others identify previously unknown side effects, if known side effects are more frequent or severe than in the past, if we or others detect unexpected safety signals for our products or product candidates, including Auryxia, vadadustat, or any product or product candidate perceived to be similar to Auryxia, vadadustat, or any other products or product candidates, or if any of the foregoing are perceived to have occurred, either before or after receipt of marketing approval, a number of potentially significant negative consequences could result, including:

- sales may be impaired;
- regulatory approvals may be restricted or withdrawn;
- we may decide to, or be required to, send drug warnings or safety alerts to physicians, pharmacists and hospitals (or the FDA or other regulatory authorities may choose to issue such alerts), or we may decide to conduct a product recall or be requested to do so by the FDA or other regulatory authority;
- reformulation of the product, additional nonclinical or clinical studies, changes in labeling or changes to or re-approvals of manufacturing facilities may be required;
- we may be precluded from pursuing additional development opportunities to enhance the clinical profile of a product within its indicated populations, or studying the product or product candidate in additional indications and populations or in new formulations; and
- government investigations or lawsuits, including class action suits, may be brought against us.

Any of the above occurrences could delay or prevent us from achieving or maintaining marketing approval, harm or prevent sales of Auryxia or, if approved, vadadustat or other product candidates, increase our expenses and impair or prevent our ability to successfully commercialize Auryxia, vadadustat or any other products or product candidates

Risks Related to Regulatory Approval of Our Product Candidates

We may be delayed in obtaining, or be unable to obtain, marketing approval or reimbursement for vadadustat or any other product candidate in certain countries outside of the United States.

Regulatory authorities outside of the United States will require compliance with numerous and varying requirements. The approval procedures vary among jurisdictions and may involve requirements for additional testing, and the time required to obtain approval may differ from that required to obtain FDA approval. In addition, in many countries outside the United States, a drug product must be approved for reimbursement before it can be marketed or sold in that country. In some cases, the prices that we intend to charge for our products are also subject to approval. Approval by the FDA does not ensure approval by regulatory or reimbursement authorities outside the United States, and approval by one regulatory or reimbursement authority outside the United States does not ensure approval by the FDA or any other regulatory or reimbursement authorities. However, the failure to obtain approval or reimbursement in one jurisdiction may negatively impact our ability to obtain approval or reimbursement in another jurisdiction. The marketing approval process in countries outside of the United States may include all of the risks associated with obtaining FDA approval and, in some cases, additional risks. We may not obtain such regulatory or reimbursement approvals on a timely basis, if at all. We may not be able to file for marketing approvals and may not receive the necessary approvals to commercialize our product candidates in any market. Also, favorable pricing in certain countries depends on a number of factors, some of which are outside of our control.

Additionally, on June 23, 2016, the electorate in the United Kingdom voted in favor of leaving the European Union, commonly referred to as Brexit. Following protracted negotiations, the United Kingdom left the European Union on January 31, 2020. Under the withdrawal agreement, there is a transitional period until December 31, 2020 (extendable up to two years). Discussions between the United Kingdom and the European Union have so far mainly focused on finalizing withdrawal issues and transition agreements but have been extremely difficult to date. To date, only an outline of a trade agreement has been reached. Much remains open, but the Prime Minister has indicated that the United Kingdom will not seek to extend the transitional period beyond the end of 2020. If no trade agreement has been reached before the end of the transitional period, there may be significant market and economic disruption. The Prime Minister has also indicated that the United Kingdom will not accept high regulatory alignment with the European Union.

Since the regulatory framework for pharmaceutical products in the United Kingdom covering quality, safety, and efficacy of pharmaceutical products, clinical trials, marketing authorization, commercial sales, and distribution of pharmaceutical products is derived from EU directives and regulations, Brexit could materially impact the future regulatory regime that applies to products and the approval of product candidates in the United Kingdom. Any delay in obtaining, or an inability to obtain, any marketing approvals, as a result of Brexit or otherwise, may force us to restrict or delay efforts to seek regulatory approval in the United Kingdom and/or the EU for our product candidates, which could significantly and materially harm our business.

Products approved for marketing are subject to extensive post-marketing regulatory requirements and could be subject to post-marketing restrictions or withdrawal from the market, and we may be subject to penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with our products, or product candidates, when and if any of them is approved.

Marketing approvals may be subject to limitations on the approved indicated uses for which the product may be marketed or other conditions of approval, or contain requirements for potentially costly post-marketing studies and surveillance to monitor the safety and efficacy of the product, including REMS, or registries or observational studies. For example, in connection with the FDA approvals of Auryxia, we initially committed to the FDA to conduct certain post-approval pediatric studies of Auryxia under the Pediatric Research Equity Act of 2003, or PREA. With regard to our Hyperphosphatemia Indication, we committed to completing the post-approval pediatric study and submitting a final report to the FDA by December 31, 2019. With regard to our IDA Indication, we committed to completing the post-approval pediatric study and submitting a final report to the FDA by January 2023. We cannot guarantee that we will be able to complete these studies and submit the final reports in a timely manner. For example, with regard to the Hyperphosphatemia Indication, we did not complete and submit the post-marketing requirement pediatric clinical study report by December 31, 2019, and we received a notification of noncompliance with PREA. We are requesting an extension of this deadline. If we are unable to complete these studies successfully, we will need to inform the FDA, have further discussions, and if the FDA finds that we failed to comply with pediatric study requirements, it could initiate proceedings to seize or enjoin the sale of Auryxia, which would have a material adverse impact on our ability to commercialize Auryxia and our ability to generate revenues from Auryxia. In addition, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion and recordkeeping for Auryxia, and any other product for which we receive regulatory approval, will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, as well as continued compliance with cGMPs and GCPs for any clinical trials that we conduct post-approval.

Moreover, the FDA and other regulatory authorities closely regulate the post-approval marketing and promotion of drugs to ensure drugs are marketed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA and other regulatory authorities impose stringent restrictions on companies' communications regarding use of their products, and if we promote our products beyond their approved indications or inconsistent with the approved label, we may be subject to enforcement actions or prosecution arising from such activities. Violations of the U.S. Federal Food, Drug, and Cosmetic Act, or the FD&C Act, relating to the promotion of prescription drugs may lead to investigations alleging violations of federal and state healthcare fraud and abuse and other laws, as well as state consumer protection laws, insurance fraud laws, third party payor actions, shareholder actions and other lawsuits.

Post-approval discovery of previously unknown problems with an approved product, including adverse events of unanticipated severity or frequency or relating to manufacturing operations or processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing, distribution, use or manufacturing of the product;
- withdrawal of the product from the market, or product recalls;
- restrictions on the labeling or marketing of a product;
- fines, restitution or disgorgement of profits or revenues;
- warning or untitled letters or clinical holds;
- refusal by the FDA or other regulatory authorities to approve pending applications or supplements to approved applications filed by us, or suspension or revocation of product approvals;

- product seizure or detention, or refusal to permit the import or export of products;
- REMS; and
- injunctions or the imposition of civil or criminal penalties.

Non-compliance with FDA, the EMA, the PMDA and other regulatory authorities' requirements regarding safety monitoring or pharmacovigilance can also result in significant financial penalties.

The FDA's policies and those of other regulatory authorities may change, and additional government regulations may be enacted. We cannot predict the likelihood, nature or extent of government regulations that may arise from future legislation or administrative action, either in the United States or in other jurisdictions. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability, which would materially adversely affect our business.

Even if we obtain favorable clinical results in our Phase 3 studies, we may not be able to obtain marketing approval for, or successfully commercialize, vadadustat, or we may experience significant delays in doing so, any of which would materially harm our business.

The clinical trials of our product candidates are, and the manufacturing and marketing of our product candidates will be, subject to extensive and rigorous review and regulation by numerous governmental authorities in the United States, and in other countries where we and our collaborators intend to test and, if approved, market any product candidates. Before obtaining marketing approval for the commercial sale of any product candidate, we must demonstrate through extensive preclinical testing and clinical trials that the product candidate is safe and effective for use in each target indication. This process can take many years and marketing approval may never be achieved. Of the large number of drugs in development in the United States and in other jurisdictions, only a small percentage successfully complete the FDA's and other jurisdictions' marketing approval processes and are commercialized. Accordingly, even if we are able to obtain the requisite capital to continue to fund our development programs, we may be unable to successfully develop or commercialize vadadustat or any other product candidates.

We and Otsuka, our collaboration partner, are not permitted to market vadadustat in the United States until we receive approval from the FDA, in the EU until we receive approval from the EMA, or in any other jurisdiction until the requisite approval from regulatory authorities in such jurisdiction is received. MTPC, our collaboration partner in Asia, will not be permitted to market vadadustat in Japan without approval from the PMDA or in any other jurisdiction until the requisite approval from regulatory authorities in such jurisdiction is received. As a condition to receiving marketing approval for vadadustat, we must complete Phase 3 studies and any additional preclinical or clinical studies required by the FDA, the EMA, the PMDA or other regulatory authorities. Vadadustat may not be successful in clinical trials or receive marketing approval. Further, vadadustat may not receive marketing approval even if it is successful in clinical trials.

Obtaining marketing approval in the United States and other jurisdictions is a complex, lengthy, expensive and uncertain process that typically takes many years and depends upon numerous factors, including the substantial discretion of the regulatory authorities. Even if our product candidates demonstrate safety and efficacy in clinical studies, the regulatory agencies may not complete their review processes in a timely manner, or we may not be able to obtain marketing approval. Furthermore, approval of a drug does not ensure successful commercialization. For example, on September 23, 2015, the European Commission, or EC, approved Fexeric for the control of hyperphosphatemia, in adult patients with CKD. Pursuant to the sunset clause under EU law, the EC's approval of Fexeric in the EU was contingent on, among other things, our commencing marketing of Fexeric within three years; although we successfully negotiated an extension to December 23, 2019, we did not commence marketing Fexeric by such date and therefore the Fexeric approval in the EU has ceased to be valid.

If the results of our global Phase 3 studies for vadadustat are positive, we plan to file for regulatory approval in the United States and other regions. In February 2020, we entered into a letter agreement, or the Letter Agreement, with Vifor Pharma relating to Vifor Pharma's agreement with a third party to purchase a Priority Review Voucher issued by the FDA, or the PRV, subject to satisfaction of customary closing conditions, or the PRV Purchase. Although a PRV entitles the holder to priority review of an NDA or a Biologics License Application for a new drug, which reduces the target FDA review time to six months after official acceptance of the submission, the utilization of a PRV does not ensure a faster review or faster approval compared to products considered for approval under conventional FDA procedures, and in any event does not assure ultimate approval by FDA. Furthermore, even if utilization of the PRV enables a faster approval of vadadustat, it may not result in faster commercialization of vadadustat. For more information on risks related to commercialization of vadadustat, see "Risks Related to Commercialization". In addition, pursuant to the Letter Agreement, we will pay Vifor Pharma \$10.0 million within fifteen business days after the closing of the PRV Purchase. Vifor Pharma is obligated to retain all rights to, and maintain the validity of, the PRV until we and Vifor Pharma (a) enter into a definitive agreement setting forth the financial and other terms by which Vifor Pharma will assign the PRV to us for use with our planned NDA for vadadustat for the treatment of anemia due to CKD in both dialysis-dependent and non-dialysis dependent patients, or (b) make a mutual decision to sell the PRV and share the proceeds based on certain terms. We may not come to terms with Vifor Pharma on assigning the PRV to us, and even if we do, we and Vifor Pharma may decide not to use the PRV for vadadustat and, instead, resell it. In the event of resale of the PRV at a price lower than the purchase price, our share of the proceeds from the resale would be lower than our \$10.0 million contribution.

In addition, the safety concerns associated with the current standard of care for the indications for which we are seeking marketing approval for our product candidates may affect the FDA's, the EMA's, the PMDA's or other regulatory authorities' review of the safety results of our compounds in development. Further, the policies or regulations, or the type and amount of clinical data necessary to gain approval, may change during the course of a product candidate's clinical development and may vary among jurisdictions. It is possible that vadadustat and any other product candidates will never obtain marketing approval. The FDA may delay, limit or deny approval of vadadustat or any other product candidates for many reasons including, among others:

- we may not be able to demonstrate that vadadustat is safe and effective in treating anemia due to CKD or that any other product candidate is safe and effective for its proposed indication(s) to the satisfaction of the FDA;
- the results of our clinical trials may only be modestly positive, or there may be concerns with the profile due to efficacy or safety;
- the results of our clinical trials may not meet the level of statistical or clinical significance required by the FDA for marketing approval;
- the FDA may disagree with the number, design, size, conduct or implementation of our clinical trials;
- the FDA may not approve the formulation, labeling or specifications we request for vadadustat or any other product candidate;
- the FDA may approve vadadustat or any other product candidate for use only in a small patient population or for fewer or more limited indications than we request;
- the FDA may require that we conduct additional clinical trials or repeat one or more clinical trials;
- the FDA may grant approval contingent on the performance of costly post-marketing clinical trials;
- we, or our CROs or vendors, may fail to comply with GXP;
- the CROs that we retain to conduct our clinical trials may not perform effectively or take actions that adversely impact our clinical trials, or we may fail to communicate effectively or provide the appropriate level of oversight of our CROs;
- we or our third party manufacturers may fail to perform in accordance with the FDA's cGMP requirements;
- the FDA may disagree with inclusion of data obtained from certain regions outside the United States to support the NDA for potential reasons such as differences in clinical practice from United States standards;
- the FDA may disagree with our interpretation of data from our preclinical studies and clinical trials;
- the FDA could deem that our financial relationships with certain principal investigators constitute a conflict of interest, such that the data from those principal investigators may not be used to support our applications;
- an FDA Advisory Committee or other regulatory advisory group or authority could recommend non-approval or restrictions on approval;
- the FDA's decision-making regarding vadadustat and any other product candidates may be impacted by the results of competitors' clinical trials and safety concerns of marketed products used to treat the same indications as the indications for which vadadustat and any other product candidates are being developed;

- the FDA may not approve the manufacturing processes or facilities of third party manufacturers with whom we contract; or
- the policies or regulations of the FDA may significantly change in a manner that renders our clinical data insufficient for approval, or requires us to amend or submit new clinical protocols.

In addition, similar reasons may cause the EMA or the PMDA or other regulatory authorities to delay, limit or deny approval of vadaustat or any other product candidate outside the United States.

If we experience delays in obtaining approval, or if we fail to obtain approval of our product candidates, the commercial prospects for our product candidates may be harmed and our ability to generate revenues will be materially impaired, which could have a material adverse effect on our business.

Risks Related to Government Regulation and Compliance

We are subject to a complex regulatory scheme that requires significant resources to ensure compliance. Failure to comply with applicable laws could subject us to government scrutiny or government enforcement, potentially resulting in costly investigations and/or fines or sanctions, or impacting our relationships with key regulatory agencies such as the FDA, SEC or the EMA.

A variety of laws apply to us or may otherwise restrict our activities, including the following:

- laws and regulations governing the conduct of preclinical and clinical studies in the United States and other countries in which we are conducting such studies;
- laws and regulations in the United States and in countries in which we are interacting with healthcare providers, patients, patient organizations and other constituencies that prohibit promoting a drug prior to approval and/or reimbursement;
- laws and regulations of countries outside the United States that prohibit pharmaceutical companies from promoting prescription drugs to the general public;
- laws, regulations and industry codes that vary from country to country and govern our relationships with healthcare providers, patients, patient organizations, and other constituencies, prohibit certain types of gifts and entertainment, establish codes of conduct and, in some instances, require disclosure to, or approval by, regulatory authorities for us to engage in arrangements with such constituencies;
- anti-corruption and anti-bribery laws, including the FCPA, the UK Bribery Act and various other anti-corruption laws in countries outside of the United States;
- data privacy laws existing in the United States, the EU and other countries in which we operate, including the U.S. Health Insurance Portability and Accountability Act of 1996, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, the GDPR, and state privacy and data protection laws, such as the California Consumer Privacy Act, or CCPA, as well as state consumer protection laws;
- federal and state laws requiring the submission of accurate product prices and notifications of price increases;
- federal and state securities laws; and
- international trade laws, which are laws that regulate the sale, purchase, import, export, re-export, transfer and shipment of goods, products, materials, services and technology.

Compliance with these and other applicable laws and regulations requires us to expend significant resources. Failure to comply with these laws and regulations may subject us to government investigations, enforcement actions by regulatory authorities, penalties, damages, fines, the restructuring of our operations, or the imposition of a clinical hold, any of which could materially adversely affect our business and would result in increased costs and diversion of management attention and could delay or prevent the development, regulatory approval and commercialization of our product candidates, any of which could have a material adverse effect on our business.

We will incur significant liability if it is determined that we are promoting any “off-label” use of Auryxia or any other product we may develop, acquire or in-license or if it is determined that any of our activities violates the federal Anti-Kickback Statute.

Physicians are permitted to prescribe drug products for uses that differ from those approved by the FDA or other applicable regulatory agencies. Although the FDA and other regulatory agencies do not regulate a physician’s choice of treatments, the FDA and other regulatory agencies do restrict manufacturer communications regarding unapproved uses of an approved drug. Companies are not permitted to promote drugs for unapproved uses or in a manner that is inconsistent with the FDA-approved labeling. There are also restrictions about making comparative or superiority claims based on safety or efficacy that are not supported by substantial evidence. Accordingly, we may not promote Auryxia in the United States for use in any indications other than the Hyperphosphatemia Indication and the IDA Indication, and all promotional claims must be consistent with the FDA-approved labeling for Auryxia. Promoting a drug off-label is a violation of the FD&C Act and can give rise to liability under the federal False Claims Act, as well as under additional federal and state laws and insurance statutes. The FDA, the Department of Justice and other regulatory and enforcement authorities enforce laws and regulations prohibiting promotion of off-label uses and the promotion of products for which marketing approval has not been obtained, as well as the false advertising or misleading promotion of drugs. In addition, laws and regulations govern the distribution and tracing of prescription drugs and prescription drug samples, including the Prescription Drug Marketing Act of 1976 and the Drug Supply Chain Security Act, which regulate the distribution and tracing of prescription drugs and prescription drug samples at the U.S. federal level and set minimum standards for the regulation of drug distributors by the states. A company that is found to have improperly promoted off-label uses or to have otherwise engaged in false or misleading promotion or improper distribution of drugs will be subject to significant liability, potentially including civil and administrative remedies as well as criminal sanctions.

Notwithstanding the regulatory restrictions on off-label promotion, the FDA and other regulatory authorities allow companies to engage in truthful, non-misleading, and non-promotional scientific communications concerning their products in certain circumstances. In addition, under some relatively recent guidance from the FDA, companies may also promote information that is consistent with the prescribing information and proactively speak to formulary committee members of payors regarding data for an unapproved drug or unapproved uses of an approved drug. We intend to engage in these discussions and communicate with healthcare providers, payors and other constituencies in compliance with all applicable laws, regulatory guidance and industry best practices. Although we believe we have put in place a robust compliance program and processes designed to ensure that all such activities are performed in a legal and compliant manner, Auryxia is our first commercial product so our implementation of our compliance program in connection with commercialization activities is still relatively new.

In addition, if a company’s activities are determined to have violated the federal Anti-Kickback Statute, this can also give rise to liability under the federal False Claims Act and such violations can result in significant fines, criminal and civil remedies, and exclusion from Medicare and Medicaid. There is increased government focus on relationships between the pharmaceutical industry and physicians, pharmacies (especially specialty pharmacies), and other sources of referrals. Common industry activities, such as speaker programs, insurance assistance and support, relationships with foundations providing copayment assistance, and relationships with patient organizations and patients are receiving increased governmental attention. If any of our relationships or activities is determined to violate applicable federal and state anti-kickback laws, false claims laws, or other laws or regulations, the company and/or company executives, employees, and other representatives could be subject to significant fines and criminal sanctions, imprisonment, and potential exclusion from Medicare and Medicaid.

Recent efforts to pursue regulatory reform may limit the FDA’s ability to engage in oversight and implementation activities in the normal course, and that could negatively impact our business.

Recently, there have been several executive actions taken, including the issuance of a number of executive orders, that could impose significant burdens on, or otherwise materially delay, the FDA’s ability to engage in routine regulatory and oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. On January 30, 2017, an executive order, applicable to all executive agencies including the FDA, was issued that requires that for each notice of proposed rulemaking or final regulation to be issued in fiscal year 2017, the agency shall identify at least two existing regulations to be repealed, unless prohibited by law. These requirements are referred to as the “two-for-one” provisions. This executive order includes a budget neutrality provision that requires the total incremental cost of all new regulations in the 2017 fiscal year, including repealed regulations, to be no greater than zero, except in limited circumstances. For fiscal years 2018 and beyond, the executive order requires agencies to identify regulations to offset any incremental cost of a new regulation. Interim guidance issued by the Office of Information and Regulatory Affairs within the Office of Management and Budget on February 2, 2017, indicates that the “two-for-one” provisions may apply not only to agency regulations, but also to significant agency guidance documents. It is difficult to predict how these requirements will be implemented, and the extent to which they will impact the FDA’s ability to exercise its regulatory authority. If these executive actions impose constraints on FDA’s ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted.

Compliance with privacy and data security requirements could result in additional costs and liabilities to us or inhibit our ability to collect and process data globally, and the failure to comply with such requirements could subject us to significant fines and penalties, which may have a material adverse effect on our business, financial condition or results of operations.

The regulatory framework for the collection, use, safeguarding, sharing, transfer and other processing of information worldwide is rapidly evolving and is likely to remain uncertain for the foreseeable future. Globally, virtually every jurisdiction in which we operate has established its own data security and privacy frameworks with which we must comply. For example, the collection, use, disclosure, transfer, or other processing of personal data regarding individuals in the EU, including personal health data, is subject to the GDPR, which took effect across all member states of the European Economic Area, or EEA, in May 2018. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including requirements relating to processing health and other sensitive data, obtaining consent of the individuals to whom the personal data relates when required, providing information to individuals regarding data processing activities, implementing safeguards to protect the security and confidentiality of personal data, providing notification of data breaches, and taking certain measures when engaging third party processors. The GDPR increases our obligations with respect to sponsors with clinical trial sites in the EEA by expanding the definition of personal data to include coded data and requiring changes to informed consent practices and more detailed notices for clinical trial patients and investigators. In addition, the GDPR also imposes strict rules on the transfer of personal data to countries outside the EU, including the United States and, as a result, increases the scrutiny that clinical trial sites located in the EEA should apply to transfers of personal data from such sites to countries that are considered to lack an adequate level of data protection, such as the United States. The GDPR also permits data protection authorities to require destruction of improperly gathered or used personal information and/or impose substantial fines for violations of the GDPR, which can be up to four percent of global revenues or 20 million Euros, whichever is greater, and it also confers a private right of action on data patients and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. In addition, the GDPR provides that EU member states may make their own further laws and regulations limiting the processing of personal data, including genetic, biometric or health data.

Given the breadth and depth of changes in data protection obligations, complying with the GDPR's requirements is rigorous and time intensive and requires significant resources and a review of our technologies, systems and practices, as well as those of any third party collaborators, service providers, contractors or consultants that process or transfer personal data collected in the EU. The GDPR and other changes in laws or regulations associated with the enhanced protection of certain types of sensitive data, such as healthcare data or other personal information from our clinical trials, could require us to change our business practices and put in place additional compliance mechanisms, may interrupt or delay our development, regulatory and commercialization activities and increase our cost of doing business, and could lead to government enforcement actions, private litigation and significant fines and penalties against us and could have a material adverse effect on our business, financial condition or results of operations.

In addition, numerous other federal and state laws, including state security breach notification laws, state health information privacy laws and federal and state consumer protection laws, govern the collection, use, and storage of personal information. For example, the CCPA went into effect on January 1, 2020, which creates new individual privacy rights for consumers (as that word is broadly defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. Failure to comply with these laws, as well as local laws outside of the U.S. in countries where we are conducting clinical trials, regarding privacy and security of personal information could expose us to fines and penalties under such laws. Even if we are not determined to have violated these laws, government investigations into these issues typically require the expenditure of significant resources and generate negative publicity, which could harm our reputation and our business.

Our relationships with healthcare providers, physicians and third party payors are subject to applicable anti-kickback, fraud and abuse, false claims, transparency, health information privacy and security, and other healthcare laws and regulations, which, in the event of a violation, could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, administrative burdens and diminished profits and future earnings.

Healthcare providers, physicians and third party payors play a primary role in the recommendation and prescription of Auryxia and any other product candidates for which we obtain marketing approval. Our arrangements with healthcare providers, physicians and third party payors expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute Auryxia and any other products or product candidates for which we obtain marketing approval. In addition, we may be subject to transparency laws and patient privacy regulation by federal and state governments and by governments in foreign jurisdictions in which we conduct our business. Restrictions under applicable federal and state healthcare laws and regulations include the following:

- the FD&C Act which among other things, strictly regulates drug product marketing and promotion and prohibits manufacturers from marketing such products for off-label use;
- federal laws that require pharmaceutical manufacturers to report certain calculated product prices to the government or provide certain discounts or rebates to government authorities or private entities, often as a condition of reimbursement under government healthcare programs, and laws requiring notification of price increases;

- the federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation or arranging of, any good or service, for which payment may be made under a federal healthcare program such as Medicare and Medicaid;
- the federal False Claims Act imposes criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for, among other things, knowingly presenting, or causing to be presented, false or fraudulent claims for payment by a federal healthcare program or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government, with potential liability including mandatory treble damages and significant per-claim penalties, currently set at \$5,500 to \$11,000 per false claim, and violations of the FD&C Act, the federal government pricing laws, and the federal Anti-Kickback Statute trigger liability under the federal False Claims Act;
- HIPAA imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- HIPAA, as amended by the HITECH, and their respective implementing regulations, also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal Physician Payments Sunshine Act (renamed the Open Payments Act) requires applicable manufacturers of covered drugs to report payments and other transfers of value to physicians and teaching hospitals;
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws and gift ban and transparency statutes, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by state Medicaid or other programs, or non-governmental third party payors, including private insurers, and which are not preempted by federal laws and often differ from state to state, thus complicating compliance efforts; and
- U.S. state laws restricting interactions with healthcare providers and other members of the healthcare community or requiring pharmaceutical manufacturers to implement certain compliance standards, which vary from state to state.

Because of the breadth of these U.S. laws, and their non-U.S. equivalents, and the narrowness of the statutory exceptions and safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws. In addition, recent healthcare reforms have strengthened these laws. For example, the Health Care Reform Act, among other things, amended the intent requirement of the federal Anti-Kickback Statute. A person or entity no longer needs to have actual knowledge of the statute or specific intent to violate the law. The Health Care Reform Act also amended the False Claims Act, such that violations of the Anti-Kickback Statute are now deemed violations of the False Claims Act.

Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines, such as the Pharmaceutical Research and Manufacturers of America Code on Interactions with Health Care Professionals, known as the PhRMA Code. Additionally, some state and local laws require the registration of pharmaceutical sales representatives in the jurisdiction. State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties comply with applicable healthcare laws and regulations involve substantial costs. One of the potential areas for governmental scrutiny involves federal and state requirements for pharmaceutical manufacturers to submit accurate price reports to the government. Because our processes for calculating applicable government prices and the judgments involved in making these calculations involve subjective decisions and complex methodologies, these calculations are subject to risk of errors and differing interpretations. In addition, they are subject to review and challenge by the applicable governmental agencies, or potential qui tam complaints, and it is possible that such reviews could result in changes, recalculations, or defense costs that may have adverse legal or financial consequences. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of products from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from participation in government funded healthcare programs.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain for any products that are approved in the United States or foreign jurisdictions.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell Auryxia and any other products or product candidates for which we obtain marketing approval. The pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by legislative initiatives. Current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any FDA approved product, such as Auryxia.

In the United States, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or the MMA, changed the way Medicare covers and pays for pharmaceutical products. The legislation expanded Medicare coverage for drug purchases by the elderly and introduced a new reimbursement methodology based on average sales prices for physician-administered drugs. In addition, this legislation provided authority for limiting the number of drugs that will be covered in any therapeutic class. Cost reduction initiatives and other provisions of this legislation could decrease the coverage and price that we receive for Auryxia and any other approved products. While the MMA applies only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates. Therefore, any reduction in reimbursement that results from the MMA may result in a similar reduction in payments from private payors.

In March 2010, President Obama signed into law the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or, collectively, the ACA. Among the provisions of the ACA of potential importance to our business including, without limitation, our ability to commercialize and the prices we obtain for Auryxia and may obtain for any of our product candidates that are approved for sale, are the following:

- an annual, non-deductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- expansion of healthcare fraud and abuse laws, including the civil False Claims Act and the federal anti-kickback statute, new government investigative powers and enhanced penalties for noncompliance;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% point-of-sale discounts off negotiated prices;
- extension of manufacturers' Medicaid rebate liability;
- expansion of eligibility criteria for Medicaid programs;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;
- new requirements to report certain financial arrangements with physicians and teaching hospitals;
- a new requirement to annually report drug samples that manufacturers and distributors provide to physicians; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

In addition, other legislative changes and regulatory have been proposed and adopted since the ACA was enacted. These changes include the Budget Control Act of 2011, which, among other things, led to aggregate reductions to Medicare payments to providers of 2% per fiscal year which will remain in effect through 2029 unless additional congressional action is taken, and the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several types of providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. In addition, other legislative and regulatory changes have been proposed, but not yet adopted. For example, in July 2019, HHS proposed regulatory changes in kidney health policy and reimbursement. Any new legislative or regulatory changes may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for Auryxia or any product candidates for which we may obtain regulatory approval or the frequency with which Auryxia and any such product candidate is prescribed or used. Further, there have been several recent U.S. congressional inquiries and proposed state and federal legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products.

We expect that these healthcare reforms, as well as other healthcare reform measures that may be adopted in the future, may result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, new payment methodologies and additional downward pressure on the price that we receive for any approved product and/or the level of reimbursement physicians receive for administering any approved product. Reductions in reimbursement levels may negatively impact the prices we receive or the frequency with which our products are prescribed or administered. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

With the enactment of the Tax Cuts and Jobs Act of 2017, Congress repealed the “individual mandate.” The repeal of this provision, which requires most Americans to carry a minimal level of health insurance, will become effective in 2019. According to the Congressional Budget Office, the repeal of the individual mandate will cause an estimated 13 million fewer Americans to be insured in 2027 and premiums in insurance markets may rise. Additionally, on January 22, 2018, the President signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called “Cadillac” tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, among other things, amended the ACA, effective January 1, 2019, to increase from 50% to 70% the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and close the coverage gap in most Medicare drug plans, commonly referred to as the “donut hole”. Further, each chamber of the U.S. Congress has put forth multiple bills designed to repeal or repeal and replace portions of the ACA. Although none of these measures has been enacted by Congress to date, Congress may consider other legislation to repeal and replace elements of the ACA.

The current administration has also taken executive actions to undermine or delay implementation of the ACA. Since January 2017, the President has signed two Executive Orders designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. One Executive Order directs federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. The second Executive Order terminates the cost-sharing subsidies that reimburse insurers under the ACA. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. In addition, CMS has recently proposed regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the ACA for plans sold through such marketplaces. Further, on June 14, 2018, the U.S. Court of Appeals for the Federal Circuit ruled that the federal government was not required to pay more than \$12 billion in ACA risk corridor payments to third party payors who argued that such payments were owed to them. The effects of this gap in reimbursement on third party payors, providers, and potentially our business, are not yet known.

Further, on December 14, 2018, a U.S. District Court judge in the Northern District of Texas ruled that the individual mandate portion of the ACA is an essential and inseparable feature of the ACA and, therefore, because the mandate was repealed as part of the Tax Cuts and Jobs Act, the remaining provisions of the ACA are invalid as well. The current administration and CMS have both stated that the ruling will have no immediate effect, and on December 30, 2018 the same judge issued an order staying the judgment pending appeal. The current administration has recently represented to the court of appeals considering this judgment that it does not oppose the lower court’s ruling. On July 10, 2019, the Court of Appeals for the Fifth Circuit heard oral argument in this case. In those arguments, the current administration argued in support of upholding the lower court decision. However, in a subsequent filing, the U.S. Department of Justice contended that the ACA should be invalidated only in the states that are suing, rather than all states. On December 18, 2019, that court affirmed the lower court’s ruling that the individual mandate portion of the ACA is unconstitutional and it remanded the case to the district court for reconsideration of the severability question and additional analysis of the provisions of the ACA. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

The costs of prescription pharmaceuticals have also been the subject of considerable discussion in the United States, and members of U.S. Congress and the current administration have stated that they will address such costs through new legislative and administrative measures. To date, there have been several recent U.S. congressional inquiries and proposed and enacted state and federal legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products. At the federal level, Congress and the current administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. Including measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients.

Specifically, there have been several recent U.S. congressional inquiries and proposed federal and proposed and enacted state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products. At the federal level, Congress and the current administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. For example, on May 11, 2018, the current administration issued a plan to lower drug prices. Under this blueprint for action, the current administration indicated that HHS will take steps to end the gaming of regulatory and patent processes by drug makers to unfairly protect monopolies, advance biosimilars and generics to boost price competition, evaluate the inclusion of prices in drug makers' ads to enhance price competition, speed access to and lower the cost of new drugs by clarifying policies for sharing information between insurers and drug makers, avoid excessive pricing by relying more on value-based pricing by expanding outcome-based payments in Medicare and Medicaid, work to give Medicare Part D plan sponsors more negotiation power with drug makers, examine which Medicare Part B drug prices could be negotiated by Medicare Part D plans, improve the design of the Medicare Part B Competitive Acquisition Program, update Medicare's drug-pricing dashboard to increase transparency, prohibit Medicare Part D contracts that include "gag rules" that prevent pharmacists from informing patients when they could pay less out-of-pocket by not using insurance, and require that Medicare Part D plan members be provided with an annual statement of plan payments, out-of-pocket spending, and drug price increases. In addition, on December 23, 2019, the current administration published a proposed rulemaking that, if finalized, would allow states or certain other non-federal government entities to submit importation program proposals to FDA for review and approval. Applicants would be required to demonstrate their importation plans pose no additional risk to public health and safety and will result in significant cost savings for consumers. At the same time, FDA issued draft guidance that would allow manufacturers to import their own FDA-approved drugs that are authorized for sale in other countries (multi-market approved products).

At the state level, individual states are increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access, marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. These measures could reduce the ultimate demand for our products or put pressure on our product pricing.

It is likely that federal and state legislatures within the United States and foreign governments will continue to consider changes to existing healthcare legislation. We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for Auryxia and any product candidates for which we receive marketing approval or additional pricing pressures. We cannot predict the reform initiatives that may be adopted in the future or whether initiatives that have been adopted will be repealed or modified. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare may adversely affect:

- the demand for Auryxia and any products candidates for which we receive marketing approval;
- our ability to set a price that we believe is fair for our products;
- our ability to obtain and maintain coverage and reimbursement approval for Auryxia or any other approved product;
- our ability to generate revenues and achieve or maintain profitability; and
- the level of taxes that we are required to pay.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could harm our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the use and disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from the use of hazardous materials by our employees, contractors or consultants, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Risks Related to our Reliance on Third Parties

If the licensor of certain intellectual property relating to Auryxia terminates, modifies or threatens to terminate existing contracts or relationships with us, our business may be materially harmed.

We do not own the rights to our product, Auryxia. We have licensed and sublicensed the rights, patent or otherwise, to Auryxia from a third party, Panion, who in turn licenses certain rights to Auryxia from one of the inventors of Auryxia. The license agreement with Panion, or the Panion License Agreement, requires us to meet development milestones and imposes development and commercialization due diligence requirements on us. In addition, under the license agreement, we must pay royalties based on a mid-single digit percentage of net sales of product resulting from the licensed technologies, including Auryxia, and pay the patent filing, prosecution and maintenance costs related to the license. If we do not meet our obligations in a timely manner, or if we otherwise breach the terms of our license agreement, Panion could terminate the agreement, and we would lose the rights to Auryxia. For example, following announcement of the Merger, Panion notified Keryx in writing that Panion would terminate the license agreement on November 21, 2018 if Keryx did not cure the breach alleged by Panion, specifically, that Keryx failed to use commercially reasonable best efforts to commercialize Auryxia outside the United States. Keryx disagreed with Panion's claims, and the parties entered discussions to resolve this dispute. On October 24, 2018, prior to the consummation of the Merger, we, Keryx and Panion entered into a letter agreement, or the Panion Letter Agreement, pursuant to which Panion agreed to rescind any and all prior termination threats or notices relating to the license agreement and waived its rights to terminate the license agreement based on any breach by us of our obligation to use commercially reasonable efforts to commercialize Auryxia outside the United States until the parties execute an amendment to the license agreement, in accordance with the terms of the Panion Letter Agreement, following consummation of the Merger. On April 17, 2019, we and Panion entered into an amendment and restatement of the Panion License Agreement, or the Panion Amended License Agreement, which reflects certain revisions consistent with the terms of the Panion Letter Agreement. See Note 4 to the Consolidated Financial Statements contained in this Annual Report on Form 10-K for additional information regarding the Panion Amended License Agreement. Even though we entered into the Panion Amended License Agreement, there are no assurances that Panion will not allege other breaches of the Panion Amended License Agreement or otherwise attempt to terminate the Panion Amended License Agreement in the future.

In addition, if Panion breaches its agreement with the inventor from whom it licenses rights to Auryxia, Panion could lose its license, which could impair or delay our ability to develop and commercialize Auryxia.

From time to time, we may have disagreements with Panion, or Panion may have disagreements with the inventor from whom it licenses rights to Auryxia, regarding the terms of the agreements or ownership of proprietary rights, which could impact the commercialization of Auryxia, could require or result in litigation or arbitration, which would be time-consuming and expensive, could lead to the termination of the Panion Amended License Agreement, or force us to negotiate a revised or new license agreement on terms less favorable than the original. In addition, in the event that the owners and/or licensors of the rights we license were to enter into bankruptcy or similar proceedings, we could potentially lose our rights to Auryxia or our rights could otherwise be adversely affected, which could prevent us from continuing to commercialize Auryxia.

We rely on third parties to conduct preclinical and clinical studies for our product and product candidates. If they do not successfully carry out their contractual duties, comply with regulatory requirements or meet expected deadlines, we may not be able to optimize the commercialization of Auryxia or obtain marketing approval for or commercialize vadadustat or any other product candidates, and our business could be substantially harmed.

We do not have the ability to independently conduct preclinical and clinical trials. We are currently relying, and expect to continue to rely, on third parties, such as CROs, clinical data management organizations, medical institutions and clinical investigators, to conduct our current and future preclinical studies and our clinical trials, including our global Phase 3 development program for vadadustat. The third parties on whom we rely may fail to perform effectively, or terminate their engagement with us, for a number of reasons, including the following:

- if the quantity or accuracy of the data obtained by the third parties is compromised due to their failure to adhere to clinical trial protocols or to regulatory requirements, or if the third parties otherwise fail to comply with clinical trial protocols, perform effectively or meet expected deadlines;
- if third parties experience staffing difficulties;
- if we fail to communicate effectively or provide the appropriate level of oversight;
- if third parties undergo changes in priorities or corporate structure or become financially distressed; or
- if they form relationships with other entities, some of which may be our competitors.

Any of these events could cause our preclinical and clinical trials, including post-approval clinical trials, to be extended, delayed, suspended, required to be repeated or terminated, or we may receive untitled warning letters or be the subject of an enforcement action which could result in our failing to obtain marketing approval of vadadustat or any other product candidates on a timely basis, or at all, or fail to maintain marketing approval of Auryxia or any other approved products, any of which would adversely affect our business operations. In addition, if the third parties on whom we rely fail to perform effectively or terminate their engagement with us, we may need to enter into alternative arrangements, which could delay, perhaps significantly, the continued optimization of the commercialization of Auryxia and the development and commercialization of vadadustat and any other product candidates.

Even though we do not directly control the third parties on whom we rely to conduct our preclinical and clinical trials and therefore cannot guarantee the satisfactory and timely performance of their obligations to us, we are nevertheless responsible for ensuring that each of our clinical trials is conducted in accordance with the applicable protocol, legal and regulatory requirements, including GXP requirements, and scientific standards, and our reliance on these third parties, including CROs, will not relieve us of our regulatory responsibilities. If we or any of our CROs, their subcontractors, or clinical trial sites fail to comply with applicable GXP requirements, the clinical data generated in our clinical trials may be deemed unreliable or insufficient, our clinical trials could be put on hold, and/or the FDA, the EMA or other regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. In addition, our clinical trials must be conducted with drug product that meets certain specifications and is manufactured under applicable cGMP regulations. These requirements include, among other things, quality control, quality assurance, and the satisfactory maintenance of records and documentation.

We also rely on third parties to store and distribute drug supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our products, resulting in additional costs and depriving us of potential product revenue. In addition, we are using an active comparator in our PRO₂TECT and INNO₂VATE clinical programs for vadadustat. If our distributors are unable to obtain sufficient supply of the active comparator for any reason, or supply active comparator to clinical trial sites in a timely manner, our clinical trials may be extended, delayed, suspended or terminated.

We rely on third parties to conduct all aspects of our product manufacturing. The loss of these manufacturers, their failure to supply us on a timely basis, or their failure to successfully carry out their contractual duties or comply with regulatory requirements could cause delays in our current and future capacity and substantially harm our business.

We do not have any manufacturing facilities and do not expect to independently manufacture any product or product candidates. We currently rely on third party manufacturers to produce all of our commercial, clinical and preclinical material supply. We expect to continue to rely on existing or alternative third-party manufacturers to supply our ongoing and planned preclinical and clinical trials and for commercial production. Our reliance on third party manufacturers increases the risk that we will not have sufficient quantities of our product and product candidates or the ability to obtain such quantities at an acceptable cost or quality, which could delay, prevent or impair our development or commercialization efforts.

We currently have two suppliers of Auryxia's drug substance, one of them with two approved sites, and one supplier with three approved sites for the supply of Auryxia drug product. If any of our suppliers were to limit or terminate production, or otherwise fail to meet the quality or delivery requirements needed to supply Auryxia at adequate levels, we could experience losses of revenue that could materially and adversely impact our results of operations. We have entered into supply agreements with Esteve Química, S.A. and Patheon Inc. for the manufacture of vadadustat drug substance and drug product, respectively, for commercial use. While we intend to put additional supply arrangements in place for commercial manufacturing of vadadustat, we may be unsuccessful in doing so or achieving sufficient redundancy due to a number of factors, including that we may not be able to negotiate binding agreements at commercially reasonable terms. For example, a contract manufacturer may require a substantial financial commitment, including a commitment to fund the purchase of a new facility or equipment. If we are unsuccessful in implementing redundant supply arrangements for commercial quantities of vadadustat, if our commercial supply arrangements for Auryxia or vadadustat are terminated, or if any of our third party manufacturers is unable to fulfill the terms of their agreements with us, are subject to regulatory review, or cease their operations for any reason, it could result in delays to our marketing approval for vadadustat and risk that we would not have sufficient quantities of our product candidates and products for clinical trials and commercialization. Even if we are ultimately successful in entering into redundant supply arrangements for commercial manufacturing of vadadustat, the timing of such additional arrangements is uncertain.

If any of our third party manufacturers cannot perform as agreed, including a misappropriation of our proprietary information, or if they terminate their engagements with us, we may be forced to manufacture the materials ourselves, for which we currently do not have the capabilities or resources, or enter into agreements with other third party manufacturers, which we may not be able to do on favorable or reasonable terms, if at all. In some cases, there may be a limited number of qualified replacement manufacturers, or the technical skills, or equipment required to manufacture a product or product candidate may be unique or proprietary to the original manufacturer and we may have difficulty transferring such skills or technology to another third party or a feasible alternative may not exist. These factors would increase our reliance on such manufacturer or require us to obtain a license from such manufacturer in order to have another third party manufacture Auryxia or our product candidates. If we are required to change manufacturers for any reason, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines. The delays associated with the verification of a new manufacturer could negatively affect our ability to continue to commercialize or satisfy patient demand for Auryxia or any other product candidate for which we receive marketing approval, or develop and receive marketing approval for our product candidates in a timely manner or within budget.

The facilities and processes used by our third party manufacturers to manufacture Auryxia may be inspected by the FDA and other regulatory authorities at any time, and the facilities and processes used by our third party manufacturers to manufacture our product candidates will be inspected by the FDA, the EMA, PMDA and other regulatory authorities prior to or after we submit our marketing application. We do not control the manufacturing processes of, and are completely dependent on, our third party manufacturers for compliance with cGMP requirements for manufacture of certain starting materials, drug substance and finished drug product. If our third party manufacturers cannot successfully manufacture material that conforms to our specifications and regulatory requirements, we will not be able to maintain marketing approval for Auryxia or secure and/or maintain marketing approval for our product candidates. In addition, we have no control over the ability of our third party manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA, the EMA or other regulatory authorities do not approve the facilities being used to manufacture our product candidates, or if they withdraw any approval of the facilities being used to manufacture Auryxia or any other product candidates for which we receive marketing approval, we may need to find alternative manufacturing facilities, which would significantly impact our ability to continue commercializing Auryxia or develop, obtain marketing approval for or market our product candidates, if approved. Moreover, the failure of our third party manufacturers to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of Auryxia or our product candidates operating restrictions or criminal prosecutions, any of which could significantly and adversely affect the supply of Auryxia or our product candidates. Also, if our starting materials, drug substance or drug product are damaged or lost while in our third party manufacturers' control, it may impact our ability to supply our products or product candidates and we may incur significant financial harm. In addition, Auryxia and our product candidates may compete with other products and product candidates for access to third party manufacturing facilities. A third party manufacturer may also encounter delays brought on by sudden internal resource constraints, labor disputes, or shifting regulatory protocols. Certain of these third party manufacturing facilities may be contractually prohibited from manufacturing our product candidates or products, due to exclusivity provisions in agreements with our competitors. There are a limited number of manufacturers that operate under cGMP regulations and are capable of manufacturing Auryxia and our product candidates for us.

Our current and anticipated future dependence on third parties for the manufacture of Auryxia and our product candidates may adversely affect our ability to continue to commercialize Auryxia or any product candidates that receive marketing approval on a timely and competitive basis and any future profit margins.

Third party manufacturers may be unable to manufacture our product and product candidates in sufficient quality and quantity, which would delay or prevent us from commercializing approved products and developing our product candidates.

As a result of the large quantity of materials required for Auryxia production and the large quantities of Auryxia tablets that are required for our commercial success, the continued commercial viability of Auryxia depends on adequate supply of starting materials that meet quality, quantity and cost standards and the ability of our contract manufacturers to continually produce drug substance and finished drug product on a commercial scale. Failure to achieve and maintain these levels of supply can jeopardize and prevent the successful continued commercialization of Auryxia. Moreover, issues that may arise in any scale-up and technology transfer of Auryxia and continued commercial scale manufacture of Auryxia may lead to significant delays in our development and commercial timelines and negatively impact our financial performance. For example, a production-related issue resulted in an interruption in the supply of Auryxia in the third and fourth quarters of 2016. This supply interruption negatively impacted Keryx's revenues in 2016. Although this supply interruption was resolved and actions designed to prevent future interruptions in the supply of Auryxia have been taken, any future supply interruptions for Auryxia or any of our product candidates for which we receive marketing approval would negatively and materially impact our reputation and financial condition.

In addition, in order to complete our development of and commercialize, if approved, vadadustat and any other product candidates, we will need to work with third party manufacturers to manufacture them in large quantities. Our current and future third party manufacturers may be unable to successfully achieve commercial scale production of vadadustat or increase the manufacturing capacity of any other product candidates for the conduct of clinical trials and commercialization in a timely or cost-effective manner, if at all. In addition, quality issues may arise during scale-up activities. Any changes in our manufacturing processes as a result of scaling up may result in the need to obtain additional marketing approvals. If our third party manufacturers are unable to achieve commercial scale production or there is a need for additional marketing approvals of vadadustat or any other product candidates, or if there are difficulties in increasing the manufacturing capacity for any other product candidates, the development, marketing approval and commercialization of that product candidate may be delayed or infeasible, or ongoing commercialization may be unsuccessful, any of which could significantly harm our business.

We do not know whether our third party manufacturers will be able to meet our demand, either because of the nature of our agreements with those third party manufacturers, or, in some cases, our limited experience with those third party manufacturers or our relative importance as a customer to those third party manufacturers. It may be difficult for us to assess their ability to timely meet our demand in the future based on past performance. While our current third party manufacturers have generally met our demand for their products on a timely basis in the past, they may subordinate our needs in the future to their other customers.

We depend on collaborations with third parties for the development and commercialization of vadadustat and Auryxia. If our collaborations are not successful or if our collaborators terminate their agreements with us, we may not be able to capitalize on the market potential of Auryxia and vadadustat, and our business could be materially harmed.

We sublicensed the rights to commercialize Riona to JT and Torii in Japan. We entered into collaboration agreements with Otsuka to develop and commercialize vadadustat in the United States, Europe, China and certain other territories. We also entered into a collaboration agreement with MTPC to develop and commercialize vadadustat in Japan and certain other Asian countries. We may form or seek other strategic alliances, joint ventures, or collaborations, or enter into additional licensing arrangements with third parties that we believe will complement or augment our commercialization efforts with respect to Auryxia and our development and commercialization efforts with respect to vadadustat and any other product candidates. Our likely collaborators for any collaboration arrangements include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies and biotechnology companies.

We may not be able to maintain our collaborations and our collaborations may not be successful due to a number of important factors, including the following:

- collaborators may have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborations may be terminated in accordance with the terms of the collaborations and, if terminated, may make it difficult for us to attract new collaborators or adversely affect how we are perceived in scientific and financial communities, and may result in a need for additional capital and expansion of our internal capabilities to pursue further development or commercialization of the applicable products and product candidates;
- if permitted by the terms of the collaborations, collaborators may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in their strategic focus, availability of funding or other external factors such as a business combination that diverts resources or creates competing priorities;
- if permitted by the terms of the collaborations, collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial, abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;

- a collaborator with marketing and distribution rights to our products may not commit sufficient resources to their marketing and distribution;
- if permitted by the terms of the collaboration, we and our collaborator may have a difference of opinion regarding the development or commercialization strategy for a particular product, and our collaborator may have ultimate decision making authority;
- disputes may arise between a collaborator and us that cause the delay or termination of activities related to research, development or commercialization of Auryxia, vadadustat and any other product candidates, or that result in costly litigation or arbitration that diverts management attention and resources;
- collaborations may not lead to development or commercialization of products and product candidates in the most efficient manner or at all;
- a significant change in the senior management team, a change in the financial condition or a change in the business operations, including a change in control or internal corporate restructuring, of any of our collaborators, could result in delayed timelines, re-prioritization of our programs, decreasing resources or funding allocated to support our programs, or termination of the collaborations; and
- collaborators may not comply with all applicable regulatory requirements.

If any of these events occurs, the market potential of our products and product candidates could be reduced, and our business could be materially harmed. We also cannot be certain that, following a collaboration, the benefits of the collaboration will outweigh the potential risks.

We may seek to establish additional collaborations and, if we are not able to establish them on commercially reasonable terms, we may have to alter our development and commercialization plans.

We will require substantial additional cash to fund the continued commercialization of Auryxia and the development and potential commercialization of vadadustat and any other product candidates. We may decide to enter into additional collaborations for the development and commercialization of vadadustat or Auryxia. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders, or disrupt our management and business.

We may not be successful in entering into additional collaborations as a result of many factors including the following:

- competition in seeking appropriate collaborators;
- a reduced number of potential collaborators due to recent business combinations in the pharmaceutical industry;
- inability to negotiate collaborations on acceptable terms;
- inability to negotiate collaborations on a timely basis;
- a potential collaborator's evaluation of our product or product candidates;
- a potential collaborator's resources and expertise; and
- restrictions due to an existing collaboration agreement.

If we are unable to enter into additional collaborations, we may have to curtail the commercialization of the product or the development of the product candidate on which we are seeking to collaborate, reduce or delay its development program or other of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further commercialize Auryxia or develop or commercialize our product candidates.

Even if we enter into additional collaboration agreements and strategic partnerships or license our intellectual property, we may not be able to maintain them or they may be unsuccessful, which could delay our timelines or otherwise adversely affect our business.

We may incur losses as a result of unforeseen or catastrophic events, including the emergence of a pandemic, terrorist attacks, extreme weather events or other natural disasters.

The occurrence of unforeseen or catastrophic events, including the emergence of a pandemic, such as the novel coronavirus disease (COVID-19), or other widespread health emergency (or concerns over the possibility of such an emergency), terrorist attacks, extreme terrestrial or solar weather events or other natural disasters, could create economic and financial disruptions, and could lead to operational difficulties that could impair our ability to manage our businesses or result in reduced sales or delays in our clinical studies, which could have a material adverse effect on our financial results. In particular, the outbreak of COVID-19 may result in closures of CMO facilities on which we rely for the supply of our product and product candidates, which could lead to delays or disruptions in supply. The outbreak of COVID-19 could also result in potential closures of clinical trial sites on which we rely for the completion of our clinical trials. In addition, the spread of COVID-19 may result in quarantines and travel restrictions or disruption impacting our employees' travel, including the travel of our sales professionals, and causing operational difficulties. Furthermore, healthcare facilities may limit access for non-patients, including our sales professionals, or we may advise our sales professionals to limit their visits to healthcare facilities, which could negatively impact our access to healthcare providers and, ultimately, our sales. At this point, the outbreak of COVID-19 has begun to have indeterminable adverse effects on general commercial activity and the world economy. However, the extent to which COVID-19 may impact our business and operations is uncertain. If we or any of the third parties with whom we engage were to experience shutdowns or other business disruptions, our ability to conduct our business in the manner and on the timelines presently planned could be materially and negatively impacted, which could have a material adverse effect on our business and our financial results.

Risks Related to our Intellectual Property

If we are unable to adequately protect our intellectual property, third parties may be able to use our intellectual property, which could adversely affect our ability to compete in the market.

Our commercial success will depend in part on our ability, and the ability of our licensors, to obtain and maintain patent protection on our drug product and technologies, and to successfully defend these patents against third party challenges. We seek to protect our proprietary products and technology by filing patent applications in the United States and certain foreign jurisdictions. The process for obtaining patent protection is expensive and time consuming, and we may not be able to file and prosecute all necessary or desirable patent applications in a cost effective or timely manner. In addition, we may fail to identify patentable subject matter early enough to obtain patent protection. Further, license agreements with third parties may not allow us to control the preparation, filing and prosecution of patent applications, or the maintenance or enforcement of patents. Such third parties may decide not to enforce such patents or enforce such patents without our involvement. Thus, these patent applications and patents may not under these circumstances, be prosecuted or enforced in a manner consistent with the best interests of the company.

Our pending patent applications may not issue as patents and may not issue in all countries in which we develop, manufacture or potentially sell our product(s) or in countries where others develop, manufacture and potentially sell products using our technologies. Moreover, our pending patent applications, if issued as patents, may not provide additional protection for our product.

The patent positions of pharmaceutical and biotechnology companies can be highly uncertain and involve complex legal and factual questions. No consistent policy regarding the breadth of claims allowed in pharmaceutical and biotechnology patents has emerged to date. Changes in the patent laws or the interpretation of the patent laws in the United States and other jurisdictions may diminish the value of our patents or narrow the scope of our patent protection. Accordingly, the patents we own or license may not be sufficiently broad to prevent others from practicing our technologies or from developing competing products. Furthermore, others may independently develop similar or alternative drug products or technologies or design around our patented drug product and technologies which may have an adverse effect on our business. If our competitors prepare and file patent applications in the United States that claim technology also claimed by us, we may have to participate in interference or derivation proceedings in front of the U.S. Patent and Trademark Office, or USPTO, to determine priority of invention, which could result in substantial cost, even if the eventual outcome is favorable to us. Because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that any related patent may expire prior to, or remain in existence for only a short period following, commercialization, thus reducing any advantage of the patent. The patents we own or license may be challenged or invalidated or may fail to provide us with any competitive advantage. Since we have licensed or sublicensed many patents from third parties, we may not be able to enforce such licensed patents against third party infringers without the cooperation of the patent owner and the licensor, which may not be forthcoming. In addition, we may not be successful or timely in obtaining any patents for which we submit applications.

Additionally, the laws of foreign countries may not protect our intellectual property rights to the same extent as do the laws of the United States. For example, claims in a patent application directed to methods of treatment of the human body are not patentable or are restricted in many non-U.S. countries. Further, we may not pursue or obtain patent protection in all major markets. In addition, in jurisdictions outside the United States where we own or license patent rights, we may be unable to prevent unlicensed parties from selling or importing products or technologies derived elsewhere using our proprietary technology.

Generally, the first to file a patent application is entitled to the patent if all other requirements of patentability are met. However, prior to March 16, 2013, in the United States, the first to invent was entitled to the patent. Since publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not

published until 18 months after filing, or in some cases not at all, we cannot know with certainty whether we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file for patent protection of such inventions. Moreover, the laws enacted by the Leahy-Smith America Invents Act of 2011, or the Act, which reformed certain patent laws in the United States, introduce procedures that permit competitors to challenge our patents in the USPTO after grant, including inter partes review and post grant review. Similar laws exist outside of the United States. The laws of the European Patent Convention, for example, provide for post-grant opposition procedures that permit competitors to challenge, or oppose, our European patents administratively at the European Patent Office.

In July 2011, a third party filed an opposition to our issued European patents, European Patent No. 2044005, or the '005 EP Patent, which covers vadadustat. During the oral proceedings, which took place on April 10, 2013, the Opposition Division of the European Patent Office decided to maintain certain claims of the patent directed to a compound chosen from a group of eight compounds, including vadadustat, as well as claims to compositions and methods for treating various diseases including, but not limited to, anemia. Both parties appealed the decision of the Opposition Division. On February 27, 2018, we withdrew the '005 EP Patent from appeal and filed a divisional patent application to pursue a focused claim set that includes claims for vadadustat, as well as pharmaceutical compositions and methods of treating anemia. We cannot be assured that such claims in the divisional application will be granted by the European Patent Office. If such claims are not granted, or the scope of the claims is significantly narrowed, we may not be able to adequately protect our rights, provide sufficient exclusivity, or preserve our competitive advantage.

We may become involved in addressing patentability objections based on third party submission of references, or we may become involved in defending our patent rights in oppositions, derivation proceedings, reexamination, inter partes review, post grant review, interference proceedings or other patent office proceedings or litigation, in the United States or elsewhere, challenging our patent rights or the patent rights of others. An adverse result in any such proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged on such a basis in the courts or patent offices in the United States and abroad. As a result of such challenges, we may lose exclusivity or freedom-to-operate or patent claims may be narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to prevent third parties from using or commercializing similar or identical products, or limit the duration of the patent protection for our products.

In addition, patents protecting our product candidate might expire before or shortly after such candidate is commercialized. Thus, our patent portfolio may not provide sufficient rights to exclude others from commercializing products similar or identical to ours.

We also rely on trade secrets and know-how to protect our intellectual property where we believe patent protection is not appropriate or obtainable. Trade secrets are difficult to protect. While we require our employees, licensees, collaborators and consultants to enter into confidentiality agreements, this may not be sufficient to adequately protect our trade secrets or other proprietary information. In addition, we share ownership and publication rights to data relating to our drug product and technologies with our research collaborators and scientific advisors. If we cannot maintain the confidentiality of this information, our ability to receive patent protection or protect our trade secrets or other proprietary information will be at risk.

The intellectual property and related non-patent exclusivity that we own or have licensed relating to our product, Auryxia, is limited, which could adversely affect our ability to compete in the market and adversely affect the value of Auryxia.

The patent rights and related non-patent exclusivity that we own or have licensed relating to Auryxia are limited in ways that may affect our ability to exclude third parties from competing against us. For example, a third party may design around our owned or licensed composition of matter patent claims or not market a product for methods of use covered by our owned or licensed patents.

Obtaining proof of direct infringement by a competitor for a method of use patent requires us to demonstrate that the competitors make and market a product for the patented use(s). Alternatively, we can prove that our competitors induce or contribute to others in engaging in direct infringement. Proving that a competitor contributes to, or induces, infringement of a patented method by another has additional proof requirements. For example, proving inducement of infringement requires proof of intent by the competitor. If we are required to defend ourselves against claims or to protect our own proprietary rights against others, it could result in substantial costs to us and the distraction of our management. An adverse ruling in any litigation or administrative proceeding could prevent us from marketing and selling Auryxia, increase the risk that a generic or other similar version of Auryxia could enter the market to compete with Auryxia, limit our development and commercialization of Auryxia, or otherwise harm our competitive position and result in additional significant costs. In addition, any successful claim of infringement asserted against us could subject us to monetary damages or injunction, which could prevent us from making or selling Auryxia. We also may be required to obtain licenses to use the relevant technology. Such licenses may not be available on commercially reasonable terms, if at all.

Moreover, physicians may prescribe a competitive identical product for indications other than the one for which the product has been approved, or “off-label” indications, that are covered by the applicable patents. Although such off-label prescriptions may directly infringe or contribute to or induce infringement of method of use patents, such infringement is difficult to prevent.

In addition, any limitations of our patent protection described above may adversely affect the value of our drug product and may inhibit our ability to obtain a collaboration partner at terms acceptable to us, if at all.

In the United States, the FDA has the authority to grant additional regulatory exclusivity protection for approved drugs where the sponsor conducts specified testing in pediatric or adolescent populations. If granted, this pediatric exclusivity may provide an additional six months which are added to the term of any non-patent exclusivity that has been awarded as well as to the regulatory protection related to the term of a relevant patent, to the extent these protections have not already expired.

In addition to patent protection, we may utilize, if granted by the FDA, pediatric exclusivity or other provisions of the FDCA such as new chemical entity, or NCE, exclusivity, or exclusivity for a new use or new formulation, to provide non-patent exclusivity for a drug product. The FDCA provides a five-year period of non-patent exclusivity within the United States to the first applicant to gain approval of a new drug application, or NDA, for an NCE. A drug is an NCE if the FDA has not previously approved any other new drug containing the same active moiety, which consists of the molecule(s) or ion(s) responsible for the action of the drug substance (but not including those portions of the molecule that cause it to be a salt or ester or which are not bound to the molecule by covalent or similar bonds). During the exclusivity period, the FDA may not accept for review an ANDA or a 505(b)(2) NDA submitted by another company for another version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, an ANDA or 505(b)(2) NDA that references an NDA product with NCE exclusivity may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FDCA also provides three years of exclusivity for an NDA, 505(b)(2) NDA or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application (for example, for new indications, dosages, or strengths of an existing drug). This three-year exclusivity covers only the conditions associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs containing the original active agent. The three-year exclusivity period, unlike five-year exclusivity, does not prevent the submission of a competing ANDA or 505(b)(2) NDA. Instead, it only prevents the FDA from granting final approval to such a product until expiration of the exclusivity period. Five-year and three-year exclusivity will not delay the submission (in the case of five-year exclusivity) or the approval (in the case of three-year exclusivity) of a full NDA submitted under section 505(b)(1) of the FDCA; however, an applicant submitting a full NDA would be required to conduct all of its own studies needed to independently support a finding of safety and effectiveness for the proposed product, or have a full right of reference to all studies not conducted by the applicant.

On August 23, 2018, Keryx submitted a Citizen Petition requesting, *inter alia*, that FDA recognize that Auryxia is eligible for five years of new chemical entity, or NCE, exclusivity based on its novel active ingredient and for three years exclusivity for the IDA Indication. On January 19, 2019, FDA responded that Auryxia is eligible for a three-year exclusivity period for the IDA Indication, which expires on November 6, 2020. FDA, however, denied the NCE exclusivity based on its determination that Auryxia contains a previously-approved active moiety (ferric cation). FDA’s decision on the Citizen Petition is subject to further review both within FDA and in the courts. On February 21, 2019, we filed a Petition for Reconsideration of FDA’s decision on the NCE determination for Auryxia.

The FDA’s determination as to whether to grant NCE exclusivity to Auryxia may also affect the timing of the 30 month stay barring FDA from granting final approval to generic versions of Auryxia. When an ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days after the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months after the receipt of the Paragraph IV notice, expiration of the patent, or a decision in the infringement case that is favorable to the ANDA applicant. We have received Paragraph IV certification notice letters regarding Abbreviated New Drug Applications, or ANDAs, submitted to the FDA, from generic drug manufacturers requesting approval for generic versions of Auryxia tablets (210 mg iron per tablet), have filed certain complaints for patent infringement relating to such ANDAs, and have entered into a settlement and license agreement with one such ANDA filer. See Part I, Item 3. Legal Proceedings for further information relating to the ANDAs, lawsuits and settlement.

In cases where NCE exclusivity has been granted to a new drug product, the 30-month stay triggered by such litigation is extended by the amount of time such that 7.5 years will elapse from the date of approval of the NDA for that product. Without NCE exclusivity, the 30-month stay on FDA final approval of an ANDA runs from the date on which the sponsor of the reference listed drug receives notice of a Paragraph IV certification from the ANDA applicant.

We cannot assure that Auryxia or any drug candidates we may acquire or in-license will obtain such pediatric exclusivity, NCE exclusivity or any other market exclusivity in the United States, EU or any other territory, or that we will be the first to receive the respective regulatory approval for such drugs so as to be eligible for any non-patent exclusivity protection. We also cannot assure that Auryxia or any drug candidates we may acquire or in-license will obtain patent term extension.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Because we rely on third parties to assist with research, development and manufacture of our product candidates, we must, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, services agreements, material transfer agreements, consulting agreements, research agreements or other similar agreements with our advisors, employees, third party contractors, collaborators and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such information becomes known by our competitors, is inadvertently incorporated into the technology of others, or is disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

In addition, these agreements typically restrict the ability of our advisors, employees, third party contractors, and consultants to publish data potentially relating to our trade secrets, although our agreements may contain certain limited publication rights. For example, any academic institution with which we may collaborate will usually expect to be granted rights to publish data arising out of such collaboration. We often grant such rights, provided that we are notified in advance and given the opportunity to delay publication for a limited time period in order for us to secure patent protection of intellectual property rights arising from the collaboration and remove confidential or trade secret information from any such publication. In the future, we may also conduct joint research and development programs that may require us to share trade secrets under the terms of our research and development or similar agreements. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of our agreements with third parties or independent development or disclosure or publication of information by any of our employees, advisors, consultants, third party contractors or collaborators. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

Litigation or third party claims of intellectual property infringement may be costly and time consuming and may delay or harm our drug discovery, development and commercialization efforts.

We may be forced to initiate litigation to enforce our contractual and intellectual property rights, or we may be sued by third parties asserting claims based on contract, tort or intellectual property infringement. In addition, third parties may have or may obtain patents in the future and claim that our product or any other technologies infringe their patents. If we are required to defend against suits brought by third parties, or if we sue third parties to protect our rights, we may be required to pay substantial litigation costs, and our management's attention may be diverted from operating our business. In addition, any legal action against our licensor or us that seeks damages or an injunction of our commercial activities relating to our product or other technologies could subject us to monetary liability, a temporary or permanent injunction preventing the development, marketing and sale of our product or such technologies, and/or require our licensor or us to obtain a license to continue to use our product or other technologies. We cannot predict whether our licensor or we would prevail in any of these types of actions or that any required license would be made available on commercially acceptable terms, if at all.

Our commercial success depends in part on our avoiding infringement of the patents and proprietary rights of third parties. The pharmaceutical and biotechnology industries are characterized by extensive litigation over patent and other intellectual property rights. We have in the past and may in the future become a party to, or be threatened with, future adversarial litigation or other proceedings regarding intellectual property rights with respect to our drug candidates. As the pharmaceutical and biotechnology industries expand and more patents are issued, the risk increases that our drug candidates may give rise to claims of infringement of the patent rights of others.

While our product candidates are in preclinical studies and clinical trials, we believe that the use of our product candidates in these preclinical studies and clinical trials in the United States falls within the scope of the exemptions provided by 35 U.S.C. Section 271(e), which provides that it shall not be an act of infringement to make, use, offer to sell, or sell within the United States or import into the United States a patented invention solely for uses reasonably related to the development and submission of information to the FDA. As a result of the Merger, our portfolio now includes a commercial product, Auryxia. Consequently, there is an increased possibility of a patent infringement claim against us. We attempt to ensure that our product candidates and the methods we employ to manufacture them, as well as the methods for their use which we intend to promote, do not infringe other parties' patents and other proprietary rights. There can be no assurance they do not, however, and competitors or other parties may assert that we infringe their proprietary rights in any event.

Third parties may hold or obtain patents or other intellectual property rights and allege in the future that the use of our products or product candidates infringes these patents or intellectual property rights, or that we are employing their proprietary technology without authorization. We do not believe that there are any currently issued U.S. patents that will prevent us from commercializing Auryxia or vadadustat; nor do we make any admission that any of such patents are valid, enforceable or infringed. Under U.S. law, a party may be able to patent a discovery of a new way to use a previously known compound, even if such compound itself is patented, provided the newly discovered use is novel and nonobvious. Such a method-of-use patent, however, if valid, only protects the use of a claimed compound for the specified methods claimed in the patent. This type of patent does not prevent persons from using the compound for any previously known use of the compound. Further, this type of patent does not prevent persons from making and marketing the compound for an indication that is outside the scope of the patented method. We are not aware of any valid U.S. patents issued to FibroGen, or any other person, that claim methods of using any of our product candidates for purposes of inhibiting hypoxia-inducible factor prolyl hydroxylases, or HIF-PHs, for the treatment of anemia due to CKD. For example, we are aware of certain patents that have been acquired by FibroGen directed to certain heterocyclic carboxamide compounds that are described as inhibitors of prolyl-4-hydroxylase. Those patents, however, are believed to have expired as of December 2014.

FibroGen has also filed other patent applications in the United States and other countries directed to purportedly new methods of using such previously known heterocyclic carboxamide compounds for purposes of treating or affecting specified conditions, and some of these applications have since issued as patents. To the extent any such patents issue or have been issued, we may initiate opposition or other legal proceedings with respect to such patents. We discuss the status of the opposition and/or invalidation proceedings against certain FibroGen patents in Part I, Item 3. Legal Proceedings of this Annual Report on Form 10-K.

There may be other patents of FibroGen or patents of other third parties of which we are currently unaware with claims to compounds, materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our drug candidates. Also, because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe.

Third parties, including FibroGen, may in the future claim that our product candidates and other technologies infringe upon their patents and may challenge our ability to commercialize vadadustat. Parties making claims against us may seek and obtain injunctive or other equitable relief, which could effectively block our ability to continue to commercialize Auryxia or further develop and commercialize vadadustat or any other product candidates. If any third party patents were held by a court of competent jurisdiction to cover the manufacturing process of any of our products or product candidates, any molecules formed during the manufacturing process or any final product itself, the holders of any such patents may be able to block our ability to commercialize such product or product candidate unless we obtained a license under the applicable patents, or until such patents expire or they are finally determined to be held invalid or unenforceable. Similarly, if any third party patent were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or our intended methods of use, including patient selection methods, the holders of any such patent may be able to block or impair our ability to develop and commercialize the applicable product candidate unless we obtained a license or until such patent expires or is finally determined to be held invalid or unenforceable. We may also elect to enter into a license in order to settle litigation or in order to resolve disputes prior to litigation. Furthermore, even in the absence of litigation, we may need to obtain licenses from third parties to advance our research or allow commercialization of our products or product candidates. Should a license to a third party patent become necessary, we cannot predict whether we would be able to obtain a license or, if a license were available, whether it would be available on commercially reasonable terms. If such a license is necessary and a license under the applicable patent is unavailable on commercially reasonable terms, or at all, our ability to commercialize our products or product candidates may be impaired or delayed, which could in turn significantly harm our business.

Further, defense of infringement claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties or redesign our products, which may be impossible or require substantial time and monetary expenditure.

We are currently involved in patent infringement lawsuits and opposition and invalidity proceedings and may in the future be involved in additional lawsuits or administrative proceedings to challenge the patents of our competitors or to protect or enforce our patents, which could be expensive, time consuming, and unsuccessful.

Competitors may infringe our patents or misappropriate our trade secrets or confidential information. To counter infringement or unauthorized use, we may be required to file infringement or misappropriation claims, which can be expensive and time-consuming. We may not be able to prevent infringement of our patents or misappropriation of our trade secrets or confidential information, particularly in countries where the laws may not protect those rights as fully as in the United States. In addition, in an infringement proceeding, a court may decide that a patent of ours is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, held unenforceable, or interpreted narrowly and held not infringed and could put our patent applications at risk of not issuing.

In addition, there may be a challenge or dispute regarding inventorship or ownership of patents or applications currently identified as being owned by or licensed to us. Defense of these claims, regardless of their merit, would involve substantial litigation expense and

would be a substantial diversion of employee resources from our business. Interference proceedings provoked by third parties or brought by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications.

Various administrative proceedings are also available for challenging patents, including interference, reexamination, inter partes review, and post-grant review proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. An unfavorable outcome in any current or future proceeding in which we are challenging third party patents could require us to cease using the patented technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms or at all. Even if we are successful, participation in interference or other administrative proceedings before the USPTO or a foreign patent office may result in substantial costs and distract our management and other employees.

For example, we are currently involved in patent infringement lawsuits against several generic companies in the federal district courts. In addition, we are currently involved in opposition or invalidation proceedings in the European Patent Office, the Japan Patent Office, the Canadian Federal Court and the United Kingdom Patents Court. These proceedings may be ongoing for a number of years and may involve substantial expense and diversion of employee resources from our business. In addition, we may become involved in additional opposition proceedings or other legal or administrative proceedings in the future. For more information, see the other risk factors under “Risks Related to our Intellectual Property” and Part I, Item 3. Legal Proceedings of this Annual Report on Form 10-K.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation and some administrative proceedings, there is a risk that some of our confidential information could be compromised by disclosure during discovery. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. The USPTO and governmental patent agencies in other jurisdictions also require compliance with a number of procedural, documentary, fee payment (such as annuities) and other similar provisions during the patent application process. While an inadvertent lapse in many cases can be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees, and failure to properly legalize and submit formal documents. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties.

We have received confidential and proprietary information from potential collaborators, prospective licensees and other third parties. In addition, we employ individuals who were previously employed at other biotechnology or pharmaceutical companies. We may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed confidential information of these third parties or our employees' former employers. We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. We may be subject to ownership disputes in the future arising, for example, from conflicting obligations of consultants or others who are involved in developing our product candidates. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against these claims, litigation could result in substantial cost and be a distraction to our management and employees.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive. Consequently, the breadth of our intellectual property rights in some countries outside the United States may be less extensive than those in the United States. In addition, the laws of some countries do not protect intellectual property rights to the same extent as laws in the United States. As a result, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other countries. Competitors may use our technologies in countries where we have not obtained patent protection to develop their own products and, further, may infringe our patents in territories where we have patent protection, but enforcement is not as strong as in the

United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in certain countries. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property, particularly those relating to pharmaceutical and biotechnology products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in countries outside of the United States could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing, and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Risks Related to our Business and Industry

If we fail to attract, keep and motivate senior management and key personnel, we may be unable to successfully develop vadadustat and commercialize Auryxia.

Recruiting and retaining qualified scientific, clinical, medical, manufacturing and sales and marketing personnel is critical to our success. We are also highly dependent on our executives, certain members of our senior management and certain members of our commercial organization. The loss of the services of our executives, senior managers or other key employees, including employees in our commercial organization, could impede the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Furthermore, replacing executives, senior managers and other key employees may be difficult and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to successfully develop, gain marketing approval of and commercialize products. We may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the intense competition among numerous biopharmaceutical companies for similar personnel, particularly in our geographic region.

We also experience competition for the hiring of personnel from universities and research institutions. In addition, we rely on contractors, consultants and advisors, including scientific and clinical advisors, to assist us in formulating and executing our research and development and commercialization strategy. Our contractors, consultants and advisors may become employed by companies other than ours and may have commitments with other entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to grow and pursue our business strategy will be limited.

We may expend our limited resources to pursue a particular product, product candidate or indication and fail to capitalize on products, product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on products, research programs and product candidates for specific indications. As a result, we may forgo or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Security breaches and unauthorized use of our IT systems and information, or the IT systems or information in the possession of our collaborators and other third-parties, could damage the integrity of our clinical studies, impact our regulatory filings, compromise our ability to protect our intellectual property, and subject us to regulatory actions that could result in significant fines or other penalties.

We, our collaborators, contractors and other third-parties rely significantly upon information technology, and any failure, inadequacy, interruption or security lapse of that technology, including any cyber security incidents, could harm our ability to operate our business effectively. In addition, we and our collaborators, contractors and other third parties rely on information technology networks and systems, including the Internet, to process, transmit and store clinical trial data, patient information, and other electronic information, and manage or support a variety of business processes, including operational and financial transactions and records, personal identifying information, payroll data and workforce scheduling information. We purchase some of our information technology from vendors, on whom our systems depend. We rely on commercially available systems, software, tools and monitoring to provide security for the processing, transmission and storage of company and customer information.

In the ordinary course of our business, we and our third party contractors maintain personal and other sensitive data on our and their respective networks, including our intellectual property and proprietary or confidential business information relating to our business and that of our clinical trial subjects and business partners. In particular, we rely on CROs and other third parties to store and manage information from our clinical trials. We also rely on third parties to manage patient information for Auryxia. The secure maintenance of this sensitive information is critical to our business and reputation.

Companies and other entities and individuals have been increasingly subject to a wide variety of security incidents, cyber-attacks and other attempts to gain unauthorized access to systems and information. These threats can come from a variety of sources, ranging in sophistication from individual hackers to state-sponsored attacks. Cyber threats may be broadly targeted, or they may be custom-crafted against our information systems or those of our vendors or third party service providers. A security breach, cyber-attack or unauthorized access of our clinical data or other data could damage the integrity of our clinical trials, impact our regulatory filings, cause significant risk to our business, compromise our ability to protect our intellectual property, and subject us to regulatory actions, including under the GDPR and CCPA discussed elsewhere in these risk factors and the privacy or security rules under federal, state, or other local laws outside of the U.S. protecting confidential or personal information, that could be expensive to defend and could result in significant fines or other penalties. Cyber-attacks can include malware, computer viruses, hacking or other unauthorized access or other significant compromise of our computer, communications and related systems. Although we take steps to manage and avoid these risks and to be prepared to respond to attacks, our preventive and any remedial actions may not be successful and no such measures can eliminate the possibility of the systems' improper functioning or the improper access or disclosure of confidential or personally identifiable information such as in the event of cyber-attacks. Security breaches, whether through physical or electronic break-ins, computer viruses, ransomware, impersonation of authorized users, attacks by hackers or other means, can create system disruptions or shutdowns or the unauthorized disclosure of confidential information.

Likewise, although we believe our collaborators, vendors and service providers, such as our CROs, take steps to manage and avoid information security risks and respond to attacks, we may be vulnerable to attacks against our collaborators, vendors or service providers, and we may not have adequate contractual remedies against such collaborators, vendors and service providers in such event. Additionally, outside parties may attempt to fraudulently induce employees, collaborators, or other contractors to disclose sensitive information or take other actions, including making fraudulent payments or downloading malware, by using "spoofing" and "phishing" emails or other types of attacks. Our employees may be targeted by such fraudulent activities. Outside parties may also subject us to distributed denial of services attacks or introduce viruses or other malware through "trojan horse" programs to our users' computers in order to gain access to our systems and the data stored therein. In the recent past, cyber-attacks have become more prevalent and much harder to detect and defend against and, because the techniques used to obtain unauthorized access, disable or degrade service, or sabotage systems change frequently and continuously become more sophisticated, often are not recognized until launched against a target and may be difficult to detect for a long time, we may be unable to anticipate these techniques or to implement adequate preventive or detective measures, and we might not immediately detect such incidents and the damage caused by such incidents.

Such attacks, whether successful or unsuccessful, or other compromises with respect to our information security and the measures we implement to prevent, detect and respond to them, could result in our incurring significant costs related to, for example, rebuilding internal systems, defending against litigation, responding to regulatory inquiries or actions, paying damages or fines, or taking other remedial steps with respect to third parties, inadvertent diversion of cash, divert the attention of our management and key information technology resources, disrupt key business operations, harm our reputation and deter business partners from working with us. A compromise with respect to our information security could lead to public exposure of personal information of our clinical trial subjects, Auryxia patients and others, and negative publicity. Publicity about vulnerabilities and attempted or successful incursions could damage the integrity of our studies or delay their completion. If a compromise to our information security were to occur and cause interruptions in our operations, it could result in a disruption of our development programs and our business operations, whether due to a loss of our trade secrets or other proprietary information or other similar disruptions. For example, any loss of clinical trial data could result in delays in our regulatory approval efforts for our product candidates and significantly increase our costs to recover or reproduce the data. In addition, such attacks could compromise our ability to protect our trade secrets and proprietary information from unauthorized access or misappropriation and a loss of, or damage to, our data or marketing applications. Inappropriate public disclosure of confidential or proprietary information could subject us to liability and cause delays in our product research, development and commercialization efforts. We currently do not maintain cybersecurity insurance to protect against losses due to security breaches.

Any failure to maintain proper functionality and security of our internal computer and information systems could result in a loss of, or damage to, our data or marketing applications or inappropriate disclosure of confidential or proprietary information, interrupt our operations, damage our reputation, subject us to liability claims or regulatory penalties, under a variety of federal, state or other applicable privacy laws, such as HIPAA, the GDPR, or state data protection laws including the CCPA, harm our competitive position and delay the further development and commercialization of our products and product candidates, or impact our relationships with Auryxia patients.

Our employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements and insider trading.

We are exposed to the risk that our employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or unauthorized activities that violate applicable laws, including the following:

- the FDA and other healthcare authorities' regulations, including those laws that require the reporting of true, complete and accurate information to regulatory authorities, and those prohibiting the promotion of unapproved drugs or approved drugs for an unapproved use;
- quality standards, including GXP;
- federal and state healthcare fraud and abuse laws and regulations and their non-U.S. equivalents;
- anti-bribery and anti-corruption laws, such as the FCPA and the UK Bribery Act or country-specific anti-bribery or anti-corruption laws, as well as various import and export laws and regulations;
- laws that require the reporting of true and accurate financial information and data; and
- U.S. securities laws and regulations and their non-U.S. equivalents.

We are conducting global clinical trials in countries where corruption is prevalent, and violations of any of these laws by our personnel or by any of our vendors or agents, such as our CROs or CMOs, could have a material adverse impact on our clinical trials and our business and could result in criminal or civil fines and sanctions. We are subject to complex laws that govern our international business practices. These laws include the FCPA, which prohibits U.S. companies and their intermediaries, such as CROs or CMOs, from making improper payments to foreign government officials for the purposes of obtaining or keeping business or to obtain any kind of advantage for the company. The FCPA also requires companies to keep accurate books and records and maintain adequate accounting controls. A number of past and recent FCPA investigations by the Department of Justice and the U.S. Securities and Exchange Commission have focused on the life sciences sector.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. Some of the countries in which we are conducting clinical trials have a history of corruption, which increases our risks of FCPA violations. In addition, the FCPA presents unique challenges in the pharmaceutical industry because in many countries' hospitals are operated by the government, and doctors and other hospital employees are considered foreign government officials. Certain payments made by pharmaceutical companies, or on their behalf by CROs, to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Additionally, the UK Bribery Act applies to our global activities and prohibits bribery of private individuals as well as public officials. The UK Bribery Act prohibits both the offering and accepting a bribe and imposes strict liability on companies for failing to prevent bribery, unless the company can show that it had "adequate procedures" in place to prevent bribery. There are also local anti-bribery and anti-corruption laws in countries where we are conducting clinical trials, and many of these also carry the risk of significant financial or criminal penalties.

We are also subject to trade control regulations and trade sanctions laws that restrict the movement of certain goods, currency, products, materials, services and technology to, and certain operations in, various countries or with certain persons. Our ability to transfer people and products among certain countries is subject to maintaining required licenses and complying with these laws and regulations.

The internal controls, policies and procedures, and training and compliance programs we have implemented to deter prohibited practices may not be effective in preventing our employees, contractors, consultants, agents or other representatives from violating or circumventing such internal policies or violating applicable laws and regulations. The failure to comply with laws governing international business practices may impact our clinical trials, result in substantial civil or criminal penalties for us and any such individuals, including imprisonment, suspension or debarment from government contracting, withdrawal of our products, if approved, from the market, or being delisted from The Nasdaq Global Market. In addition, we may incur significant costs in implementing sufficient systems, controls and processes to ensure compliance with the aforementioned laws.

The laws and regulations referenced above may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. It is not always possible to identify and deter misconduct by employees and third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, or if any such action is instituted against our employees, consultants, vendors or principal investigators, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, curtailment of our operations, disclosure of our confidential information and imprisonment, any of which could adversely affect our ability to operate our business and our results of operations.

We may encounter difficulties in managing our growth and expanding our operations successfully.

As we commercialize Auryxia and advance our product candidates through development and commercialization, we have expanded and may need to further expand our clinical, medical, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for us. In addition, we may encounter difficulties in managing the expanded operations of a larger and more complex company following the Merger as well as challenges associated with managing an increasingly diversified business.

We have strategic collaborations for the commercialization of Riona and the development and commercialization of vadadustat. As our operations expand, we expect that we will need to manage additional relationships with various strategic collaborators, consultants, vendors, suppliers and other third parties. Future growth will impose significant added responsibilities on members of management.

In addition, in connection with the Merger, we have experienced and may to continue to experience significant growth in our employee base for sales, marketing, operational, managerial, financial, human resources, compliance, drug development, quality, regulatory and medical affairs and other areas. This growth has imposed and will continue to impose significant added responsibilities on members of management, including the need to recruit, hire, retain, motivate and integrate additional employees, including employees who joined us in connection with the Merger. Also, our management may have to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities, including the integration of Keryx's business with our business.

Our future financial performance and our ability to commercialize Auryxia and vadadustat or any other product candidate, if approved, and to compete effectively will depend, in part, on our ability to manage any future growth effectively. To manage our recent and anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. In addition, we may need to adjust the size of our workforce as a result of changes to our expectations for our business, which can result in diversion of management attention, disruptions to our business, and related expenses. The physical expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations. We may not be able to accomplish these tasks, and our failure to accomplish any of them could prevent us from successfully growing our company or realizing the anticipated benefits of the Merger.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our product and product candidates.

We face an inherent risk of product liability as a result of the use of our product commercially, and clinical testing of our product candidates, and we will face an even greater risk if we commercialize any additional products in the future. For example, we may be sued if our product or any of our product candidates allegedly causes injury or is found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product or product candidate, negligence, strict liability and breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our products and product candidates. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, product liability claims may result in:

- decreased demand for any product or product candidates;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- delay or termination of clinical trials;
- our inability to continue to develop a product candidate;
- significant costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to study subjects or patients;
- product recalls or withdrawals, or labeling, marketing or promotional restrictions;
- decreased demand for a product or product candidate;

- loss of revenue;
- the inability to commercialize any product or product candidates; and
- a decline in our stock price.

Failure to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop. We currently carry product liability insurance that we believe is appropriate for our company. Although we maintain product liability insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies also have various exclusions, and we may be subject to a product liability claim for which we have insufficient or no coverage. If we have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, we may not have, or be able to obtain, sufficient capital to pay such amounts. In addition, insurance coverage is becoming increasingly expensive, and we may not be able to maintain insurance coverage at a reasonable cost. We also may not be able to obtain additional insurance coverage that will be adequate to cover product liability risks that may arise. Consequently, a product liability claim may result in losses that could be material to our business.

Risks Related to our Common Stock

Our stock price has been and may continue to be volatile, which could result in substantial losses for purchasers of our common stock and lawsuits against us and our officers and directors.

Our stock price has been and will likely continue to be volatile. The stock market in general and the market for smaller pharmaceutical and biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. Since our initial public offering in March 2014, the price of our common stock as reported on The Nasdaq Global Market has ranged from a low of \$2.99 on November 13, 2019 to a high of \$31.00 on June 20, 2014. The market price of shares of our common stock could be subject to wide fluctuations in response to many risk factors listed in this section, developments related to and results of our clinical studies, developments related to our regulatory submissions, developments related to our ability to commercialize Auryxia and any other approved product candidates, announcements by us or our competitors of significant mergers, acquisitions, licenses, strategic collaborations, joint ventures, collaborations or capital commitments, negative publicity around Auryxia, vadadustat or any other product or product candidate, the results of competitive clinical trials, products or technologies, regulatory or legal developments in the United States and other countries, developments or disputes concerning patent applications, issued patents or other proprietary rights, the recruitment or departure of key personnel, the level of expenses related to Auryxia, vadadustat or any other product or product candidate or clinical development programs, actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts, variations in our financial results or those of companies that are perceived to be similar to us, changes in the structure of healthcare payment systems, market conditions in the pharmaceutical and biotechnology sectors, general economic, industry and market conditions and others beyond our control. As a result of this volatility, our shareholders may not be able to sell their common stock at or above the price at which they purchased it.

In addition, companies that have experienced volatility in the market price of their stock have frequently been the subject of securities class action and shareholder derivative litigation. See Part I, Item 3. Legal Proceedings for information concerning securities class action and shareholder derivative lawsuits initiated against Keryx and certain current and former directors and officers of ours and Keryx's. In addition, we could be the target of other such litigation in the future. Class action and shareholder derivative lawsuits, whether successful or not, could result in substantial costs, damage or settlement awards and a diversion of our management's resources and attention from running our business, which could materially harm our reputation, financial condition and results of operations.

The issuance of additional shares of our common stock or the sale of shares of our common stock by any of our directors, officers or significant shareholders will dilute our shareholders' ownership interest in Akebia and may cause the market price of our common stock to decline.

Most of our outstanding common stock can be traded without restriction at any time. As such, sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell such shares, could reduce the market price of our common stock.

According to the most recent filings made under Section 13(d) and 13(g) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, Baupost Group Securities, L.L.C., or Baupost, beneficially owned approximately 16% of our outstanding common stock, and our former director Muneer Satter, beneficially owned approximately 3% of our outstanding common stock. Subject to certain restrictions, Baupost and Mr. Satter are able to sell their shares of common stock in the public market from time to time without registering them, subject to certain limitations on the timing, amount and method of those sales imposed by Rule 144 under the Securities Act of 1933, as amended. In addition, pursuant to our registration rights agreement with Baupost and our Fourth Amended and Restated Investors' Rights Agreement, as amended, with Mr. Satter, Baupost and Mr. Satter have the right, subject to certain conditions and with certain exceptions, to require us to file registration statements covering the shares common stock they own or to include their shares in registration statements that we may file or in public offerings of our shares of common stock. Following their registration and sale under the applicable registration statement, those shares would become freely tradable. By exercising their registration rights and selling a large number of shares of common stock, Baupost and Mr. Satter could cause the price of our common stock to decline.

We have a significant number of shares that are subject to outstanding options, restricted stock units and a warrant, and in the future we may issue additional options, restricted stock units, warrants or other derivative securities convertible into our common stock. The exercise or vesting of any such options, restricted stock units, warrants or other derivative securities, and the subsequent sale of the underlying common stock, could cause a further decline in our stock price. These sales also might make it difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate. Also, the Merger was financed by the issuance of shares of our common stock to shareholders of Keryx, comprising approximately 50.6% of our issued and outstanding shares of common stock, calculated based on our fully diluted market capitalization as of the date of signing the Agreement and Plan of Merger relating to the Merger. Keryx shareholders may decide not to hold the shares of our common stock they received in the Merger. Other Keryx shareholders, such as funds with limitations on the amount of stock they are permitted to hold in individual issuers, may be required to sell the shares of our common stock they received in the Merger. Such sales of our common stock could result in higher than average trading volume and may cause the market price for our common stock to decline.

In addition, we currently have on file with the SEC a universal shelf registration statement, which allows us to offer and sell certain registered securities, such as common stock, preferred stock, warrants and units, from time to time pursuant to one or more offerings at prices and terms to be determined at the time of sale.

Sales of substantial amounts of shares of our common stock or other securities by our employees or our other shareholders or by us under our universal shelf registration statement, pursuant to at-the-market offerings, or otherwise could dilute our stockholders, lower the market price of our common stock and impair our ability to raise capital through the sale of equity securities.

Insiders and significant stockholders could cause us to take actions that may not be, or refrain from taking actions that may be, in our best interest or in the best interest of all of our stockholders.

As of December 31, 2019, we believe that our directors and executive officers, together with their affiliates, beneficially owned, in the aggregate, approximately 2% of our outstanding common stock. In addition, we have certain significant stockholders, including Baupost, which beneficially owned approximately 16% of our outstanding common stock according to the most recent filings made under Section 13(d) and 13(g) of the Exchange Act. As a result, if certain significant stockholders were to choose to act together, they would be able to control all matters submitted to our stockholders for approval, as well as our management and affairs, such as:

- the composition of our Board of Directors;
- the adoption of amendments to our Ninth Amended and Restated Certificate of Incorporation and Amended and Restated By-Laws;
- the approval of mergers or sales of substantially all of our assets;
- our capital structure and financing; and
- the approval of contracts between us and these shareholders or their affiliates, which could involve conflicts of interest.

This concentration of ownership could harm the market price of our common stock by:

- delaying, deferring or preventing a change in control of our company and making some transactions more difficult or impossible without the support of these stockholders, even if such transactions are beneficial to other stockholders;
- impeding a merger, consolidation, takeover or other business combination involving our company; or
- entrenching our management or our Board of Directors.

Moreover, the interests of these stockholders may conflict with the interests of other stockholders, and we may be required to engage in transactions that may not be agreeable to or in the best interest of us or other stockholders.

We will continue to incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to compliance initiatives and corporate governance practices.

As a public company, and particularly on and after December 31, 2019 when we ceased to be an “emerging growth company”, we will continue to incur significant legal, accounting and other expenses. The Sarbanes-Oxley Act of 2002, or the SOX Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of The Nasdaq Global Market and other applicable securities rules and regulations impose various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to continue to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations have and will continue to increase our legal and financial compliance costs and make some activities more time-consuming and costly, especially since, as of December 31, 2019, we are no longer an “emerging growth company” and we therefore may no longer take advantage of certain exemptions from various reporting requirements that are applicable to public companies that are “emerging growth companies”.

We cannot predict or estimate the amount of additional costs we may incur to continue to operate as a public company, nor can we predict the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies, which could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

If we are unable to satisfy the requirements of Section 404 of the Sarbanes-Oxley Act or fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud. As a result, stockholders could lose confidence in our financial and other public reporting which would harm our business and the trading price of our common stock.

Effective internal control over financial reporting is necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, is designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations. In addition, any testing by us, as and when required, conducted in connection with Section 404 of the SOX Act, or Section 404, or any testing by our independent registered public accounting firm, which became required as of December 31, 2019, may reveal deficiencies in our internal control over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements or identify other areas for further attention or improvement. As a larger company following the Merger, implementing and maintaining effective controls may require more resources, and we may encounter internal control integration difficulties. For example, as of December 31, 2019, management and our independent registered public accounting firm concluded that our disclosure controls and procedures were not effective because of a material weakness in our internal control over financial reporting relating to our inventory process. No adjustments to our current or prior period financial statements were required as a result of this material weakness. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our common stock. Although we expect to remediate this material weakness in the short term, we may not be successful in our efforts to do so.

We will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to remediate control deficiencies and improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude within the prescribed timeframe that our internal control over financial reporting is effective as required by Section 404. If we are not able to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner each year, we could be subject to sanctions or investigations by the Securities and Exchange Commission, the Nasdaq Stock Market or other regulatory authorities which would require additional financial and management resources and could adversely affect the market price of our common stock. Furthermore, if we cannot provide reliable financial reports or prevent fraud, our business and results of operations could be harmed and investors could lose confidence in our reported financial information.

Provisions in our organizational documents and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our Ninth Amended and Restated Certificate of Incorporation, Amended and Restated By-Laws contain provisions that may have the effect of discouraging, delaying or preventing a change in control of us or changes in our management. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our Board of Directors is responsible for appointing certain members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our Board of Directors. Among other things, these provisions:

- authorize “blank check” preferred stock, which could be issued by our Board of Directors without stockholder approval and may contain voting, liquidation, dividend and other rights superior to our common stock;
- create a classified Board of Directors whose members serve staggered three-year terms;
- specify that special meetings of our stockholders can be called only by our Board of Directors pursuant to a resolution adopted by a majority of the total number of directors;
- prohibit stockholder action by written consent;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our Board of Directors;
- provide that our directors may be removed only for cause;
- provide that vacancies on our Board of Directors may be filled only by a majority of directors then in office, even though less than a quorum;
- require a supermajority vote of 75% of the holders of our capital stock entitled to vote or the majority vote of our Board of Directors to amend our Amended and Restated By-Laws; and
- require a supermajority vote of 85% of the holders of our capital stock entitled to vote to amend the classification of our Board of Directors and to amend certain other provisions of our Ninth Amended and Restated Certificate of Incorporation.

These provisions, alone or together, could delay or prevent hostile takeovers, changes in control or changes in our management.

In addition, Section 203 of the Delaware General Corporation Law prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person which together with its affiliates owns, or within the last three years has owned, 15% of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner.

Any provision of our Ninth Amended and Restated Certificate of Incorporation, our Amended and Restated By-Laws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

Our ability to use net operating losses to offset future taxable income may be subject to certain limitations.

Under Section 382 of the Internal Revenue Code, or Section 382, a corporation that undergoes an “ownership change” is subject to limitations on its ability to utilize its pre-change net operating losses, or NOLs, to offset future taxable income. On December 12, 2018, we completed the Merger, which we believe has resulted in a change in control under Section 382. Future changes in our stock ownership, many of which are outside of our control, could result in an additional ownership change under Section 382. As a result, if we generate taxable income, our ability to use our pre-change NOL carryforwards to offset federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. In addition, at the state level, there may be periods during which the use of NOL carryforwards is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed.

Furthermore, our ability to utilize our NOLs is conditioned upon our attaining profitability and generating U.S. taxable income. As described above under “—Risks Related to our Financial Position and Need for Additional Capital,” we have incurred significant net losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future; thus, we do not know whether or when we will generate the U.S. taxable income necessary to utilize our NOLs. A valuation allowance has been provided for the entire amount of our NOLs.

Our Ninth Amended and Restated Certificate of Incorporation designates the state or federal courts located in the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our Ninth Amended and Restated Certificate of Incorporation provides that, subject to limited exceptions, the state and federal courts located in the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our Ninth Amended and Restated Certificate of Incorporation or our Amended and Restated By-Laws, or (4) any other action asserting a claim against us that is governed by the internal affairs doctrine. Under our Ninth Amended and Restated Certificate of Incorporation, this exclusive forum provision will not apply to claims that are vested in the exclusive jurisdiction of a court or forum other than the Court of Chancery of the State of Delaware, or for which the Court of Chancery of the State of Delaware does not have subject matter jurisdiction. For instance, the provision would not apply to actions arising under federal securities laws, including suits brought to enforce any liability or duty created by the Securities Exchange Act of 1934, as amended, or the rules and regulations thereunder. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our Ninth Amended and Restated Certificate of Incorporation described above. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and employees. Alternatively, if a court were to find these provisions of our Ninth Amended and Restated Certificate of Incorporation inapplicable to, or unenforceable with respect to, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

We are currently subject to putative securities class action litigation and other legal proceedings, which could result in substantial costs and divert management's attention, and we could be subject to additional legal proceedings.

We are currently subject to putative securities class action litigation and other legal proceedings as described in Part I, Item 3. Legal Proceedings. In addition, securities class action and derivative lawsuits and other legal proceedings are often brought against companies for any of the risks described in this Annual Report on Form 10-K following a decline in the market price of their securities. In connection with any litigation or other legal proceedings, we could incur substantial costs, and such costs and any related settlements or judgments may not be covered by insurance. We could also suffer an adverse impact on our reputation and a diversion of management's attention and resources, which could have a material adverse effect on our business.

Because we do not anticipate paying any cash dividends on our capital in the foreseeable future, capital appreciation, if any, will be our stockholders' sole source of gain.

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the development and growth of our business. In addition, the terms of our current or future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be our stockholders' sole source of gain for the foreseeable future.

Item 1B. Unresolved Staff Comments

None

Item 2. Properties

Our corporate headquarters are located in Cambridge, Massachusetts. We currently lease approximately 65,167 square feet of office and lab space in Cambridge, Massachusetts, and 27,300 square feet of office space in Boston, Massachusetts. Excluding renewal options, the lease for the Cambridge, Massachusetts office space expires on September 11, 2026, the lease for the Cambridge, Massachusetts lab space expires on November 30, 2021, and the lease for the Boston, Massachusetts office space expires on February 28, 2023. In September 2019, Keryx entered into an agreement to sublease the Boston office space to Foundation Medicine, Inc. We believe that our existing facilities are adequate to meet our current needs, and that suitable additional alternative spaces will be available in the future on commercially reasonable terms for our future growth.

Item 3. Legal Proceedings

Legal Proceedings Relating to Vadadustat

Opposition Proceedings Against Patents Covering Vadadustat

In July 2011, a third party filed an opposition to our issued European Patent No. 2044005, or the '005 EP Patent, in the European Patent Office, or the EPO. During the oral proceedings, which took place on April 10, 2013, the Opposition Division of the EPO maintained the '005 EP Patent. This decision resulted in the maintenance of a claim directed to a compound chosen from a group of eight compounds, including vadadustat, as well as claims to compositions and methods for treating various diseases, including, but not limited to, anemia. Both parties appealed the decision of the Opposition Division of the EPO. On February 27, 2018, we withdrew the '005 EP Patent from appeal and filed a divisional patent application to pursue a focused claim set that includes claims for vadadustat, as well as pharmaceutical compositions and methods of treating anemia.

In September 2018, Dr. Reddy's Laboratories Limited filed an opposition to our issued Indian Patent No. 287720, or the '720 IN Patent, in the Indian Patent Office.

Opposition and Invalidity Proceedings Against FibroGen, Inc.

We filed an opposition in the EPO against FibroGen, Inc.'s, or FibroGen's, European Patent No. 1463823, or the '823 EP Patent on December 5, 2013, and an oral proceeding took place March 8 and 9, 2016. Following the oral proceeding, the Opposition Division of EPO ruled that the patent as granted did not meet the requirements for patentability under the European Patent Convention and, therefore, revoked the patent in its entirety. FibroGen has appealed that decision. Likewise, we also filed an invalidity proceeding before the Japan Patent Office, or JPO, on June 2, 2014 against certain claims of FibroGen's Japanese Patent No. 4804131, or the '131 JP Patent, which is the Japanese counterpart to the '823 EP Patent, and the JPO issued a preliminary decision finding all of the challenged claims to be invalid. FibroGen subsequently amended the claims and the JPO accepted the amendments. The resulting '131 JP Patent does not cover vadadustat or any pyridine carboxamide compounds. To date, FibroGen has been unsuccessful in its attempts to obtain a patent in the United States covering the same claim scope as it obtained initially in Europe and Japan in the '823 EP Patent and '131 JP Patent. In the event FibroGen were to obtain such a patent in the United States, we may decide to challenge the patent as we have done in Europe and Japan.

On May 13, 2015, May 20, 2015 and July 6, 2015, we filed oppositions to FibroGen's European Patent Nos. 2322155, or the '155 EP Patent, 1633333, or the '333 EP Patent, and 2322153, or the '153 EP Patent in the EPO, respectively, requesting the patents be revoked in their entirety. These related patents claim, among other things, various compounds that either stabilize HIF α or inhibit a HIF hydroxylase or a HIF prolyl hydroxylase, or HIF-PH, for treating or preventing various conditions, including, among other things, iron deficiency, microcytosis associated with iron deficiency, anemia of chronic disease, anemia wherein the subject has a transferrin saturation of less than 20%, anemia refractory to treatment with exogenously administered erythropoietin and microcytosis in microcytic anemia. Such method of use patents do not prevent persons from using the compound for other uses, including any previously known use of the compound. In particular, these patents do not claim methods of using any of our product candidates for purposes of inhibiting HIF-PH for the treatment of anemia due to chronic kidney disease, or CKD. While we do not believe these patents will prevent us from commercializing vadadustat for the treatment of anemia due to CKD, we filed these oppositions to provide us and our collaborators with maximum flexibility for developing vadadustat and our pipeline of HIF-PHI compounds.

Oppositions to the '155 EP Patent and the '153 EP Patent were also filed in the EPO by Glaxo Group Limited, or Glaxo, and by Bayer Intellectual Property GmbH, Bayer Pharma Aktiengesellschaft, and Bayer Animal Health GmbH, or, collectively, Bayer.

With regard to the opposition that we filed in Europe against the '333 EP Patent, an oral proceeding took place on December 8 and 9, 2016. Following the oral proceeding, the Opposition Division of the EPO ruled that the patent as granted did not meet the requirements for patentability under the European Patent Convention and, therefore, revoked the patent in its entirety. On December 9, 2016, FibroGen filed a notice to appeal the decision to revoke the '333 EP Patent.

In oral proceedings held on May 29, 2017, regarding the '155 EP Patent, the European Opposition Division ruled that the '155 EP Patent as granted did not meet the requirements for patentability under the European Patent Convention and, therefore, revoked the patent in its entirety. FibroGen filed a notice to appeal the decision to revoke the '155 EP Patent on May 29, 2017.

Subsequently, in related oral proceedings held on May 31, 2017 and June 1, 2017 for the '153 EP Patent, the Opposition Division of the EPO maintained the patent after FibroGen significantly narrowed the claims to an indication for which vadadustat is not intended to be developed. We and Glaxo separately filed notices to appeal the decision to maintain the '153 EP Patent on November 9, 2017. Bayer filed a notice to appeal the decision on November 14, 2017.

On April 3, 2019, we filed oppositions to FibroGen's European Patent Nos. 2289531, or the '531 EP Patent, and 2298301, or the '301 EP Patent in the EPO, respectively, requesting the patents be revoked in their entirety.

On May 21, 2018, we filed a Statement of Claim in Canadian Federal Court to challenge the validity of three of FibroGen's HIF-related patents in Canada: CA 2467689, CA 2468083, and CA 2526496.

On June 22, 2018, we and our collaboration partner in Japan, Mitsubishi Tanabe Pharma Corporation, or MTPC, jointly filed a Request for Trial before the JPO to challenge the validity of one of FibroGen's HIF-related patents in Japan, JP4845728. On July 20, 2018 and August 13, 2018, we and MTPC jointly filed a Request for Trial before the JPO to challenge the validity of two additional FibroGen HIF-related patents in Japan, JP5474872 and JP5474741, respectively. On September 26, 2019, the JPO conducted an invalidation trial for JP5474872 and JP4845728. On November 11, 2019, the JPO conducted an invalidation trial for JP5474741. On February 10, 2020, the JPO issued a pre-notice of a trial decision for JP4845728, which invalidated all claims except two claims in amended form, which we believe will not prevent our collaboration partner MTPC from launching vadadustat for the treatment of anemia due to CKD in Japan.

On December 13, 2018, we and our collaboration partner, Otsuka Pharmaceutical Co. Ltd., or Otsuka, filed Particulars of Claim in the Patents Court of the United Kingdom, or the UK, to challenge the validity of FibroGen's six HIF-related patents in the UK: the '823 EP Patent (UK), the '333 EP Patent (UK), the '153 EP Patent (UK), the '155 EP Patent (UK), European Patent (UK) No. 2,289,531, or the '531 EP Patent (UK), and European Patent (UK) No. 2,298,301, or the '301 EP Patent (UK). In May 2019, Astellas Pharma Inc., or Astellas, the exclusive licensee of FibroGen's HIF-related patents, sued Akebia and Otsuka for patent infringement in the Patents Court of the UK. In September 2019, we and Otsuka filed an Amended Particulars of Claim to include FibroGen's European Patent No. 1487472, or the '472 EP Patent (UK). On February 28, 2020, the parties agreed to dismiss the '472 EP Patent (UK) from the trial. A trial is currently ongoing.

Legal Proceedings Relating to Aurixia

ANDA Litigation

On October 31, 2018, November 6, 2018, December 24, 2018 and February 4, 2019, Keryx received Paragraph IV certification notice letters regarding Abbreviated New Drug Applications, or ANDAs, submitted to the U.S. Food and Drug Administration, or FDA, by Lupin Atlantis Holdings SA, or Lupin, Teva Pharmaceuticals USA, Inc., or Teva, Chemo Research S.L., or Chemo, and Mylan Pharmaceuticals Inc., or Mylan, respectively, requesting approval for generic versions of Aurixia tablets (210 mg iron per tablet). On December 13, 2018, Keryx and its licensors, Panion & BF Biotech, Inc., or Panion, and Chen Hsing Hsu, M.D., filed a complaint for patent infringement against Lupin and Lupin Ltd., or the Lupin Defendants, in the United States District Court for the District of Delaware, or the Delaware District Court, arising from Lupin's ANDA filing with the FDA. On December 19, 2018, Keryx and Panion filed a complaint for patent infringement against Teva and Teva Pharmaceutical Industries Limited, or the Teva Defendants, in the Delaware District Court arising from Teva's ANDA filing with the FDA. On February 1, 2019, Keryx, Panion and Dr. Hsu filed a complaint for patent infringement against Chemo and Insud Pharma S.A., or the Chemo Defendants, in the Delaware District Court arising from Chemo's ANDA filing with the FDA. On March 15, 2019, Keryx, Panion and Dr. Hsu filed a complaint for patent infringement against Mylan in the United States District Court for the Northern District of West Virginia arising from Mylan's ANDA filing with the FDA. On April 18, 2019, Keryx, Panion and Dr. Hsu filed a motion with the Judicial Panel on Multidistrict Litigation seeking to consolidate these four cases in the Delaware District Court for pretrial proceedings.

On March 29, 2019, April 2, 2019, and April 12, 2019, Keryx received Paragraph IV certification notice letters regarding ANDAs submitted to the FDA by Lupin Ltd., Watson Laboratories, Inc., or Watson, a wholly-owned, indirect subsidiary of Teva, and Par Pharmaceutical, Inc., or Par, an Endo International company, or Endo, respectively, requesting approval for generic versions of Aurixia tablets (210 mg iron per tablet). On May 10, 2019, Keryx, Panion and Dr. Hsu filed a complaint for patent infringement against Lupin Ltd. in the Delaware District Court arising from Lupin Ltd.'s ANDA filing with the FDA. On May 10, 2019, Keryx and Panion filed a complaint for patent infringement against Watson and the Teva Defendants, or the Watson Defendants, in the Delaware District Court arising from Watson's ANDA filing with the FDA. On May 15, 2019, Keryx and Panion filed a complaint for patent infringement against the Watson Defendants in the United States District Court for the District of Nevada, or the Nevada District Court, from Watson's ANDA filing with the FDA. On May 23, 2019, Keryx and Panion filed a complaint for patent infringement against Par in the Delaware District Court arising from Par's ANDA filing with the FDA. On May 24, 2019, Keryx and Panion filed a complaint for patent infringement against Par, in the United States District Court for the Southern District of New York, or the Southern New York District Court, arising from Par's ANDA filing with the FDA. On June 4, 2019, Keryx and Panion filed a notice of voluntary dismissal to dismiss the suit in the Nevada District Court in view of the Watson Defendants' consent to venue of the Delaware District Court. On June 26, 2019, Keryx, Panion and Dr. Hsu notified the Judicial Panel on Multidistrict Litigation of additional actions in the Delaware District Court against the Lupin Defendants and the Watson Defendants. On July 31, 2019, the Judicial Panel on Multidistrict Litigation issued an order to consolidate all of our ANDA cases in Delaware District Court for pretrial proceedings. On August 26, 2019, Keryx filed an amended complaint against the Lupin Defendants in the Delaware District Court arising from the Lupin Defendants' ANDA filings with the FDA. On September 19, 2019, the Delaware District court set a trial date for February 8, 2021.

As a result of the timely filing of these lawsuits in accordance with the relevant statute, a 30-month stay of approval will be imposed by the FDA on Lupin's ANDA, Teva's ANDA, Chemo's ANDA, Mylan's ANDA, Lupin Ltd.'s ANDA, Watson's ANDA, and Par's ANDA, which stays are expected to remain in effect until April 2021, May 2021, June 2021, August 2021, September 2021, October 2021, and October 2021, respectively, absent an earlier judgment by the court in each of these lawsuits finding the patents at issue invalid, unenforceable or not infringed. We and the other plaintiffs in each of these lawsuits are seeking, among other relief, an order that the effective date of FDA approval of the ANDA be a date no earlier than the expiration of each of the patents at issue and equitable relief enjoining the Lupin Defendants, the Teva Defendants, the Chemo Defendants, Mylan, and the Watson Defendants from infringing these patents.

On July 22, 2019, Keryx received from Teva a supplemental Paragraph IV certification notice letter regarding its ANDA. On July 22, 2019, Keryx received from Watson a supplemental Paragraph IV certification notice letter regarding its ANDA. On July 31, 2019, Keryx received from Lupin a supplemental Paragraph IV certification notice letter regarding its ANDA. On July 31, 2019, Keryx received from Lupin Ltd. a supplemental Paragraph IV certification notice letter regarding its ANDA. On September 17, 2019, Keryx received from Par a supplemental Paragraph IV certification notice letter regarding its ANDA. On October 16, 2019, Keryx received from Mylan a supplemental Paragraph IV certification notice letter regarding its ANDA.

On August 2, 2019, Keryx and Panion entered into a settlement and license agreement with Par resolving patent litigation brought by Keryx and Panion in response to Par's ANDA seeking approval to market a generic version of Auryxia tablets prior to the expiration of the applicable patents. Pursuant to the terms of the settlement, Keryx and Panion will grant Par a license to market a generic version of Auryxia in the United States beginning on March 20, 2025 (subject to FDA approval), or earlier under certain circumstances customary for settlement agreements of this nature. Additionally, in accordance with the agreement, the parties will terminate all ongoing litigation between Keryx and Panion and Par regarding Auryxia patents pending in the Delaware District Court and the Southern New York District Court. The settlement and license agreement is confidential and subject to review by the U.S. Federal Trade Commission and the U.S. Department of Justice. On August 5, 2019, the parties filed a request to stay the litigation pending a review of the settlement and license agreement by these regulatory authorities. On September 6, 2019 and September 9, 2019, the Southern New York District Court and the Delaware District Court, respectively, entered a stipulation and order of dismissal filed by the parties to dismiss the actions against Par.

CMS Litigation

On October 15, 2019, we filed a complaint in the United States District Court for the District of Massachusetts, or the Massachusetts District Court, against Centers for Medicare & Medicaid Services, or CMS, the U.S. Department of Health and Human Services, Alex M. Azar II in his official capacity as Secretary of Health and Human Services, and Seema Verma in her official capacity as administrator for CMS challenging CMS's decision that Auryxia would no longer be covered by Medicare for the treatment of iron deficiency anemia, or IDA, in adult patients with CKD not on dialysis, or the IDA Indication, and CMS's related decision that imposed a prior authorization requirement for Auryxia in the treatment of adult patients with CKD on dialysis, or the Hyperphosphatemia Indication. On October 29, 2019, we filed a motion for a preliminary injunction asking the court to provide relief while the lawsuit is pending, specifically, to restore coverage for Auryxia when used for the IDA Indication, and to remove the prior authorization requirement for Auryxia when used for the Hyperphosphatemia Indication. In the alternative, we filed a motion for summary judgment with the court asking it to decide the case on the merits now in our favor. On February 4, 2020, the court denied our request for a preliminary injunction. We filed an expedited appeal with the Court of Appeals for the First Circuit challenging the district court's denial of our motion for a preliminary injunction. The appeal is currently pending.

Shareholder Litigation Relating to Auryxia Supply

Four putative class action lawsuits were filed against Keryx Biopharmaceuticals, Inc., or Keryx, and certain of its former officers (Gregory P. Madison, Scott A. Holmes, Ron Bentsur, and James Oliviero) and consolidated in the Massachusetts District Court, captioned Karth v. Keryx Biopharmaceuticals, Inc., et al. (filed October 26, 2016, with an amended complaint filed on February 27, 2017). Plaintiff sought to represent all stockholders who purchased shares of Keryx common stock between May 8, 2013 and August 1, 2016. The complaint alleges that Keryx and the named individual defendants violated Sections 10(b) and/or 20(a) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and Rule 10b-5 promulgated thereunder by making allegedly false and/or misleading statements concerning Keryx, its supplier relationships, and future prospects, and that the allegedly misleading statements were not made known to the market until Keryx's August 1, 2016 announcement of an interruption in its supply of Auryxia. By order dated July 19, 2018, the Massachusetts District Court granted in part and denied in part the defendants' motion to dismiss the complaint. On February 27, 2019, defendants filed a motion for judgment on the pleadings. On April 30, 2019, plaintiff filed a motion to further amend his complaint, and also moved for class certification. The Massachusetts District Court heard oral argument on the motions for judgment on the pleadings and class certification on June 19, 2019.

On September 23, 2019, the Massachusetts District Court issued a Memorandum and Order denying plaintiff's motion for class certification, granting defendants' motion for judgment on the pleadings, and denying plaintiff's motion for leave to further amend his Complaint. That same day, the Massachusetts District Court entered a final judgment in favor of defendants on all claims. On September 24, 2019, plaintiff filed a notice of appeal. Plaintiff tendered his appeal brief for filing on December 16, 2019 and tendered a corrected version of such brief on December 30, 2019. The Court of Appeals for the First Circuit has not yet set a deadline for Defendants' appeal brief or set an oral argument date for the appeal.

Two stockholder derivative complaints also were filed on December 16, 2016 against Keryx and certain of its former officers (Gregory P. Madison, Scott A. Holmes, Ron Bentsur and James Oliviero) certain of its former directors (Kevin J. Cameron, Daniel P. Regan, Steven C. Gilman, Michael Rogers Michael P. Tarnok, Joseph Feczko, Jack Kaye Wyche Fowler, Jr. and John P. Butler), some of whom are current directors and officers of ours, in the Superior Court of Massachusetts, one captioned Venkat Vara Prasad Malleedi v. Keryx Biopharmaceuticals, Inc., et al., and one captioned James Anderson v. Keryx Biopharmaceuticals, Inc., et al. Each of these two complaints generally alleges breach of fiduciary duty, unjust enrichment, abuse of control, mismanagement and corporate waste. On June 27, 2017, the Superior Court of Massachusetts granted the parties' motion to consolidate and stay the derivative litigations, and that stay remains in effect. All of the complaints seek unspecified damages, interest, attorneys' fees, and other costs. It is expected that such complaints would be dismissed if the above-mentioned ruling of the Massachusetts District Court entering judgment for the defendants in the case brought under the securities laws stands; however, as discussed above, we are awaiting the outcome of the appeal of that judgment.

We deny any allegations of wrongdoing and intend to continue vigorously defending against the shareholder lawsuits described in this section. There is no assurance, however, that we will be successful in the defense of these lawsuits, or any associated appeals, or that insurance will be available or adequate to fund any settlement or judgment or the litigation costs of these actions. Moreover, we are unable to predict the outcome or reasonably estimate a range of possible losses at this time. A resolution of these lawsuits in a manner adverse to us, however, could have a material effect on our financial position and results of operations in the period in which a particular lawsuit is resolved.

Other Matters

On June 28, 2018, we entered into an Agreement and Plan of Merger with Keryx and Alpha Therapeutics Merger Sub, Inc., or the Merger Sub, pursuant to which the Merger Sub would merge with and into Keryx, with Keryx becoming a wholly owned subsidiary of ours, or the Merger. On December 12, 2018, we completed the Merger. In October and November 2018, four purported shareholders of Keryx filed four separate putative class actions, or the Merger Securities Actions, against Keryx, a former officer and director of Keryx (Jodie P. Morrison, who is now a director of ours), former directors of Keryx (Kevin J. Cameron, Mark J. Enyedy, Steven C. Gilman, Michael T. Heffernan, Daniel P. Regan and Michael Rogers, some of whom are current members of our Board of Directors), and, with respect to the Rosenblatt action discussed below, the Merger Sub and Akebia, challenging the disclosures made in connection with the Merger.

Three of the Merger Securities Actions were filed in the Delaware District Court: Corwin v. Keryx Biopharmaceuticals, Inc., et al. (filed October 16, 2018); Van Hulst v. Keryx Biopharmaceuticals, Inc., et al. (filed October 24, 2018); and Andreula v. Keryx Biopharmaceuticals, Inc., et al. (filed November 1, 2018). The fourth Merger Securities Action was filed in the Massachusetts District Court: Rosenblatt v. Keryx Biopharmaceuticals, Inc., et al. (filed October 23, 2018). On February 19, 2019, the plaintiff in the Rosenblatt action filed a notice of voluntary dismissal of the action without prejudice. On March 27, 2019, the plaintiff in the Van Hulst action filed a notice of voluntary dismissal of the action without prejudice.

On April 2, 2019, the Delaware District Court granted Abraham Kiswani, a member of the putative class in both the Andreula and Corwin actions, and plaintiff John Andreula's motion to consolidate the remaining two Merger Securities Actions pending in the Delaware District Court and consolidated the Corwin and Andreula cases under the caption In re Keryx Biopharmaceuticals, Inc., or the Consolidated Action. The Delaware District Court also appointed Kiswani and plaintiff Andreula as lead plaintiffs for the Consolidated Action. On June 3, 2019, the lead plaintiffs filed a consolidated amended complaint in the Consolidated Action, or the Consolidated Complaint. The Consolidated Complaint generally alleges that the registration statement filed in connection with the Merger contained allegedly false and misleading statements or failed to disclose certain allegedly material information in violation of Section 14(a) and 20(a) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and Rule 14a-9 promulgated thereunder. The alleged misstatements or omissions relate to (i) certain financial projections for Keryx and Akebia and certain financial analyses performed by our advisors and (ii) any alleged negotiations that may have taken place regarding the conversion of certain convertible notes of Keryx in connection with the Merger. The Consolidated Complaint seeks compensatory and/or rescissory damages, a declaration that the defendants violated Sections 14(a) and 20(a) of the Exchange Act and Rule 14a-9 thereunder, and an award of lead plaintiffs' costs, including reasonable allowance for attorneys' fees and experts' fees. The defendants in the Consolidated Action moved to dismiss the Consolidated Complaint in its entirety on August 2, 2019. Briefing on the defendants' motion to dismiss was completed on November 20, 2019, and a decision on the motion to dismiss has not yet been issued.

On December 10, 2018, a stockholder of Keryx, Michael J. Donnelly, filed a complaint against Keryx pursuant to Section 220 of the Delaware General Corporation Law in the Delaware Court of Chancery, captioned Donnelly v. Keryx Biopharmaceuticals, Inc., or the Donnelly Action. The Donnelly Action sought inspection of various Keryx books and records, purportedly to investigate “possible wrongdoing,” in connection with Keryx’s negotiation and approval of the Merger, as well as the independence of former members of Keryx’s Board of Directors, some of whom are current members of our Board of Directors. In addition to the production of books and records, the Donnelly Action sought costs and expenses incurred in the action, including reasonable attorneys’ fees. On January 31, 2019, Keryx answered the complaint in the Donnelly Action. The Delaware Court of Chancery entered a scheduling order to govern the Donnelly Action on March 28, 2019. The trial for the Donnelly Action took place on July 10, 2019. On October 24, 2019, the Delaware Chancery Court issued a written decision granting inspection, denying the plaintiff’s request for costs and expenses, and directing the parties to confer on the proper scope of the inspection.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

Our common stock is traded on The Nasdaq Global Market under the symbol "AKBA".

Holders

At March 1, 2020, there were approximately 30 holders of record of our common stock. The actual number of holders of our common stock is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers or held by other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Dividends

We have never declared or paid any cash dividends on our common stock. We currently intend to retain earnings, if any, for use in our business and do not anticipate paying cash dividends on our common stock in the foreseeable future. Payment of future dividends, if any, on our common stock will be at the discretion of our board of directors after taking into account various factors, including our financial condition, operating results, anticipated cash needs, and plans for expansion.

Issuer Purchases of Equity Securities

None.

Recent Sales of Unregistered Securities

None.

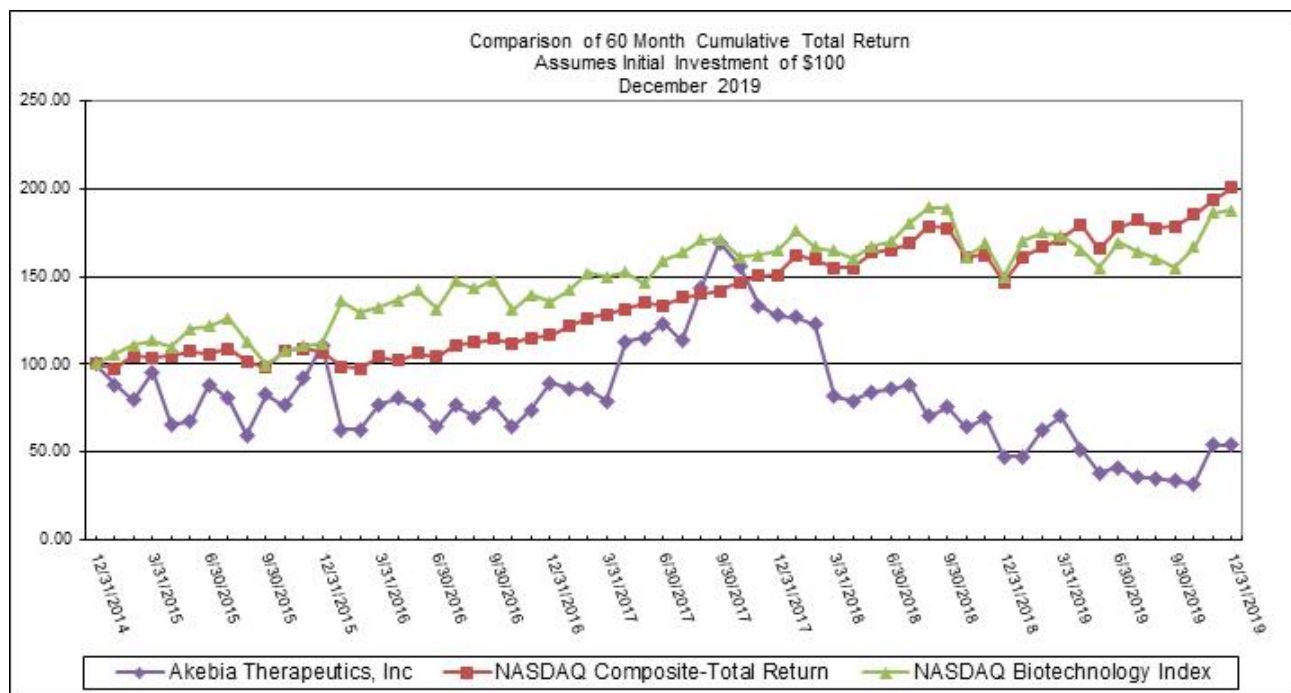
Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Comparative Stock Performance Graph

The following performance graph and related information shall not be deemed to be "soliciting material" or "filed" with the SEC or subject to Regulation 14A or 14C, or to the liabilities of Section 18 of the Exchange Act, except to the extent that we specifically request that this information be treated as soliciting material or we specifically incorporate it by reference into a filing under the Securities Act of 1933, as amended, or the Exchange Act.

Set forth below is a graph comparing the total cumulative returns of Akebia Therapeutics, Inc., the Nasdaq Composite Index and the Nasdaq Biotechnology Index. The graph assumes \$100 was invested on December 31, 2014 in our common stock and each of the indices and that all dividends, if any, are reinvested. The performance shown represents past performance and should not be considered an indication of future performance.



Securities Authorized for Issuance under Equity Compensation Plans

Information about our equity compensation plans is incorporated herein by reference to Item 12, Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters, of this Annual Report on Form 10-K.

Item 6. Selected Financial Data

The selected consolidated financial data set forth below for the years ended December 31, 2019, 2018 and 2017 and as of December 31, 2019 and 2018 are derived from our audited consolidated financial statements, which are included elsewhere in this Annual Report on Form 10-K. The selected consolidated financial data for the years ended December 31, 2016 and 2015 and as of December 31, 2017, 2016 and 2015 are derived from our audited consolidated financial statements that are not included elsewhere in this Annual Report on Form 10-K. You should read these data together with “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K under the captions “Financial Statements and Supplementary Data.” The selected financial data in this section are not intended to replace our consolidated financial statements and related notes and are qualified in their entirety by the consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K. Our historical results for any prior period are not necessarily indicative of results to be expected in any future period.

	Year Ended December 31,				
	2019	2018	2017	2016	2015
(in thousands, except share and per share data)					
Consolidated statements of operations data:					
Revenues:					
Product revenue, net	\$ 111,119	\$ 6,824	\$ —	\$ —	\$ —
License, collaboration and other revenue	223,882	200,918	181,227	1,535	—
Total revenues	335,001	207,742	181,227	1,535	—
Cost of goods sold	145,336	7,768	—	—	—
Operating expenses	475,953	378,135	257,901	137,995	61,513
Loss from operations	(286,288)	(178,161)	(76,674)	(136,460)	(61,513)
Other income (expense), net	(2)	6,235	3,003	713	797
Benefit for income taxes	(6,631)	(28,338)	—	—	—
Net loss	\$ (279,659)	\$ (143,588)	\$ (73,671)	\$ (135,747)	\$ (60,716)
Net loss per share applicable to common stockholders— basic and diluted ⁽¹⁾	\$ (2.36)	\$ (2.47)	\$ (1.69)	\$ (3.60)	\$ (2.29)
Weighted-average number of common shares used in net loss per share applicable to common stockholders— basic and diluted	118,395,919	58,038,252	43,500,795	37,716,949	26,469,170

- (1) See Note 2 of the notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K for a description of the method used to calculate basic and diluted net loss per share of common stock.

	December 31,				
	2019	2018	2017	2016	2015
(in thousands)					
Consolidated Balance Sheet Data:					
Cash and cash equivalents and available for sale securities	\$ 147,694	\$ 321,640	\$ 317,792	\$ 260,343	\$ 138,454
Working capital	101,415	202,582	217,250	182,053	129,149
Total assets	771,201	996,540	364,257	300,216	142,940
Accumulated deficit	(794,054)	(514,395)	(370,807)	(297,136)	(161,389)
Total stockholders’ equity	394,757	635,928	122,574	68,120	130,998

Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations

You should read the following discussion and analysis of our financial condition and results of operations together with our consolidated financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. Some of the information contained in this discussion and analysis, including information with respect to our plans and strategy for our business, includes forward-looking statements that involve significant risks and uncertainties. As a result of many factors, including those factors set forth in the “Risk Factors” section of this Annual Report on Form 10-K, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis. Please also refer to the section under the heading “Note Regarding Forward-Looking Statements.”

Operating Overview

We are a biopharmaceutical company focused on the development and commercialization of renal therapeutics for people living with kidney disease. Our portfolio includes a late-stage product candidate and a commercial product:

- **Vadadustat** is an investigational, oral hypoxia-inducible factor prolyl hydroxylase inhibitor, or HIF-PHI, in global Phase 3 development for two indications: (1) anemia due to chronic kidney disease, or CKD, in adult patients on dialysis, or DD-CKD, and (2) anemia due to CKD in adult patients not on dialysis, or NDD-CKD. We believe vadadustat has the potential to set a new oral standard of care for patients with anemia due to CKD, subject to regulatory approval. Vadadustat is designed to mimic the physiologic effect of altitude on oxygen availability. At higher altitudes, the body responds to lower oxygen availability with stabilization of hypoxia-inducible factor, or HIF, which can lead to red blood cell, or RBC, production and improved oxygen delivery to tissues.
- **Auryxia® (ferric citrate)** is approved and marketed in the United States for two indications: (1) the control of serum phosphorus levels in adult patients with DD-CKD, or the Hyperphosphatemia Indication, and (2) the treatment of iron deficiency anemia, or IDA, in adult patients with NDD-CKD, or the IDA Indication. Ferric citrate is also approved and marketed in Japan as an oral treatment for the improvement of hyperphosphatemia in patients with CKD, including DD-CKD and NDD-CKD, under the trade name Riona® (ferric citrate hydrate).

If the results of our global Phase 3 studies for vadadustat are positive, we plan to file for regulatory approval in the United States and other regions. In connection with our plan to file for regulatory approval for vadadustat in the United States, we entered into a letter agreement on February 14, 2020, or the Letter Agreement, with Vifor (International) Ltd., or Vifor Pharma, relating to Vifor Pharma’s agreement with a third party to purchase a Priority Review Voucher, or the PRV, issued by the U.S. Food and Drug Administration, or FDA, subject to satisfaction of customary closing conditions, or the PRV Purchase. A PRV entitles the holder to priority review of a New Drug Application, or NDA, or a Biologics License Application for a new drug, which reduces the target FDA review time to six months after official acceptance of the submission, and could lead to expedited approval. Pursuant to the Letter Agreement, we will pay Vifor Pharma \$10.0 million within fifteen business days after the closing of the PRV Purchase. Vifor Pharma is obligated to retain all rights to, and maintain the validity of, the PRV until we and Vifor Pharma (a) enter into a definitive agreement setting forth the financial and other terms by which Vifor Pharma will assign the PRV to us for use with our planned NDA for vadadustat for the treatment of anemia due to CKD in both DD-CKD and NDD-CKD patients, or (b) make a mutual decision to sell the PRV and share the proceeds based on certain terms.

We plan to commercialize vadadustat, subject to FDA approval, in the United States with our existing nephrology-focused commercial organization, while also leveraging our collaboration with Otsuka Pharmaceutical Co. Ltd., or Otsuka, and its U.S. commercial organization. We also granted Otsuka exclusive rights to commercialize vadadustat in Europe, China and certain other markets, subject to marketing approvals. In Japan and certain other countries in Asia, we granted Mitsubishi Tanabe Pharma Corporation, or MTPC, exclusive rights to commercialize vadadustat, subject to marketing approvals. In addition, we granted Vifor Pharma an exclusive license to sell vadadustat solely to Fresenius Kidney Care Group LLC, or FKC, which manages approximately 40% of the dialysis patients in the United States, at its U.S. dialysis clinics, and to certain third party dialysis organizations in the United States, approved by us, or Third Party Dialysis Organizations, which account for up to an additional 20% of the dialysis market in the United States. The license granted to Vifor Pharma would be effective upon FDA approval of vadadustat in the DD-CKD indication, the earlier of a determination by the Centers for Medicare & Medicaid Services, or CMS, that vadadustat will be included in Medicare’s bundled reimbursement model or that vadadustat will be reimbursed using the Transitional Drug Add-On Payment Adjustment, or TDAPA, and a milestone payment by Vifor Pharma.

We market Auryxia in the United States with our well-established, nephrology-focused commercial organization. Our Japanese sublicensee, Japan Tobacco, Inc., or JT, and its subsidiary, Torii Pharmaceutical Co., Ltd., or Torii, commercialize Riona in Japan.

Auryxia is our only product approved for sale in the United States and it generated approximately \$111.1 million in revenue from U.S. product sales during the year ended December 31, 2019. We have funded our operations primarily through equity offerings, strategic collaborations and debt.

We have never been profitable and have incurred net losses in each year since inception. Our net losses were \$279.7 million, \$143.6 million and \$73.7 million for the years ended December 31, 2019, 2018 and 2017, respectively. Substantially all of our net losses resulted from costs incurred in connection with our development efforts relating to vadadustat, including preparing for and conducting clinical studies of vadadustat, providing general and administrative support for these operations and protecting our intellectual property.

We expect to continue to incur significant expenses and operating losses for the foreseeable future. The amount of our future net losses will depend, in part, on the rate of our future expenditures, and our financial position will depend, in part, on our product revenue from Auryxia and, if approved, vadadustat, and our ability to obtain additional funding. We expect to continue to incur significant expenses if and as we:

- conduct our development program of vadadustat for the treatment of anemia due to CKD, including PRO₂TECT and INNO₂VATE and other ongoing or planned studies with respect to vadadustat, and develop plans for and conduct the preclinical and clinical development of any other potential product candidates;
- continue our commercialization activities for Auryxia and plan for the commercialization of vadadustat, if approved, and any other product or product candidate, including those that may be in-licensed or acquired;
- continue our integration activities as a result of our merger, or the Merger, with Keryx Biopharmaceuticals, Inc., or Keryx;
- seek marketing approvals for our product candidates that successfully complete clinical studies, and maintain marketing approvals for Auryxia and any product candidate for which we obtain marketing approval, including complying with any post-marketing regulatory requirements;
- have our product candidates manufactured for clinical trials and for commercial sale;
- initiate any post-marketing approval studies, Phase 4 studies or any other clinical trials for Auryxia or any other product, including those that may be in-licensed or acquired;
- seek to discover additional product candidates;
- engage in transactions, including strategic, merger, collaboration, acquisition and licensing transactions, pursuant to which we would market and develop commercial products, or develop and commercialize other product candidates and technologies;
- make royalty, milestone or other payments under our license agreements and any future license agreements;
- maintain, protect and expand our intellectual property portfolio;
- attract and retain skilled personnel;
- continue to create additional infrastructure and expend additional resources to support our operations as a public company, including any additional infrastructure and resources necessary to support the transition from our prior status as an emerging growth company; and
- experience any delays or encounter issues with any of the above.

We have one product approved for commercial sale but have not generated, and may not generate, enough product revenue from the sale of Auryxia to realize net profits from product sales. We have no manufacturing facilities, and all of our manufacturing activities are contracted out to third parties. Additionally, we currently utilize contract research organizations, or CROs, to carry out our clinical development activities. If we obtain marketing approval for any of our product candidates, and as we continue to commercialize Auryxia, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. If and until we can generate a sufficient amount of revenue from product sales, we expect to finance future cash needs through public or private equity or debt transactions, payments from our collaborators, royalty transactions, strategic transactions, or a combination of these approaches. If we are unable to raise additional capital in sufficient amounts when needed or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of our product or one or more of our product candidates. Any of these events could significantly harm our business, financial condition and prospects.

From inception through December 31, 2019, we raised approximately \$494.6 million of net proceeds from the sale of equity including \$377.4 million from various underwritten public offerings, \$67.2 million from at-the-market offerings, or ATM offerings, pursuant to sales agreements with Cantor Fitzgerald & Co and \$50.0 million from the sale of 3,571,429 shares of common stock to Vifor Pharma. In addition, on November 11, 2019, we entered into a loan agreement, or the Loan Agreement, with funds managed by Pharmakon Advisors LP, or Pharmakon, pursuant to which term loans in an aggregate principal amount of \$100.0 million were made available to us in two tranches, subject to certain terms and conditions, or the Term Loans. On November 25, 2019, we drew down the first tranche of \$80.0 million from the Term Loans and received net proceeds of \$77.3 million. Subsequent to December 31, 2019 and through February 4, 2020, we raised \$56.7 million from ATM offerings. At inception of our collaboration agreements with Otsuka and MTPC, our collaborators committed to an aggregate of approximately \$573.0 million or more in cost-share funding, which we generally continue to receive on a quarterly prepaid basis, and license payments. Of these commitments, we received approximately \$272.0 million at the onset of the collaboration agreements.

Financial Overview

Revenue

To date, our revenues have been derived from collaboration revenues, which include license and milestone payments and cost-sharing revenue, generated through collaboration and license agreements with partners for the development and commercialization of vadadustat and, following the Merger, commercial sales of Auryxia and royalty revenue from sales of Riona in Japan. Cost-sharing revenue represents amounts reimbursed by our collaboration partners for expenses incurred by us for research and development activities and, potentially, co-promotion activities, under our collaboration agreements.

We expect our revenue to continue to be generated primarily from our collaborations with Otsuka and MTPC and any other collaborations into which we may enter, as well as commercial sales of Auryxia in the United States, and royalty revenue from JT and Torii.

Cost of Goods Sold

Cost of goods sold includes direct costs to manufacture commercial drug substance and drug product for Auryxia, as well as indirect costs including costs for packaging, shipping, insurance and quality assurance, idle capacity charges, write-offs for inventory that fails to meet specifications or is otherwise no longer suitable for commercial sale, and royalties due to the licensor of Auryxia related to the U.S. product sales recognized during the period.

As a result of the Merger and the application of purchase accounting, costs of goods sold also includes amortization expense associated with the fair value of the developed product rights for Auryxia, which is being amortized over nine years, as well as expense associated with the fair value inventory step-up, which we expect to incur over approximately two and a half years from the date of the Merger.

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for the development of our product candidates, which include:

- personnel-related expenses, including salaries, benefits, recruiting fees, travel and stock-based compensation expense of our research and development personnel;
- expenses incurred under agreements with CROs and investigative sites that conduct our clinical studies;
- the cost of acquiring, developing and manufacturing clinical study materials through contract manufacturing organizations, or CMOs;
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance and other supplies; and
- costs associated with preclinical, clinical and regulatory activities.

Research and development costs are expensed as incurred. Costs for certain development activities are recognized based on an evaluation of the progress to completion of specific tasks using information and data provided to us by our vendors and our clinical sites.

We cannot determine with certainty the duration and completion costs of current or future clinical studies of our product candidates or if, when, or to what extent we will generate revenue from the commercialization and sale of any of our product candidates that obtain marketing approval. We may never succeed in achieving marketing approval for any of our product candidates.

The duration, costs and timing of clinical studies and development of our product candidates will depend on a variety of factors including, but not limited to, those described in Part I, Item 1A. Risk Factors. A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. For example, if the FDA, the European Medicines Agency, or the EMA, or other regulatory authorities were to require us to conduct clinical studies in addition to or different from those that we currently anticipate, or if we experience delays in any of our clinical studies, we could be required to expend significant additional financial resources and time on the completion of clinical development.

From inception through December 31, 2019, we have incurred \$1,076.8 million in research and development expenses. We expect to have significant research and development expenditures for the foreseeable future as we continue the development of vadadustat and any other product candidates.

Our direct research and development expenses consist principally of external costs, such as fees paid to clinical trial sites, consultants, central laboratories and CROs in connection with our clinical studies, and drug substance and drug product manufacturing for clinical studies.

We currently have four clinical trials for our global Phase 3 clinical program for vadadustat to which the majority of our research and development costs are attributable. A significant portion of our research and development costs have been external costs, which we track on a program-by-program basis. These external costs include fees paid to investigators, consultants, central laboratories and contract research organizations in connection with our clinical trials, and costs related to acquiring and manufacturing clinical trial materials. Our internal research and development costs are primarily personnel-related costs, depreciation and other indirect costs. We do not track our internal research and development expenses on a program-by-program basis as they are deployed across multiple projects under development.

Prior to 2019, we did not track or record our external research and development expenses on a program-by-program basis. The following table summarizes our external research and development expenses by program, as well as expenses not allocated to programs, for the year ended December 31, 2019:

	<u>Year ended December 31,</u>	
	<u>2019</u>	
	<i>(in thousands)</i>	
Vadadustat external costs	\$	253,259
External costs for other programs		20,311
Total external research and development expenses		273,570
Headcount, consulting, facilities and other		49,399
Total research and development expenses	\$	322,969

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist primarily of salaries and related costs for personnel, including stock-based compensation and travel expenses for our commercial personnel, including our field sales force and other commercial support personnel, as well as personnel in executive and other administrative or non-research and development functions. Other selling, general and administrative expenses include facility-related costs, fees for directors, accounting and legal services fees, recruiting fees and expenses associated with obtaining and maintaining patents.

Results of Operations

Comparison of the Years Ended December 31, 2019 and 2018

	Year ended December 31,		Increase (Decrease)
	2019	2018	
	(In Thousands)		
Revenues:			
Product revenue, net	\$ 111,119	\$ 6,824	\$ 104,295
License, collaboration and other revenue	223,882	200,918	22,964
Total revenues	335,001	207,742	127,259
Cost of goods sold:			
Product	108,935	6,251	102,684
Amortization of intangible assets	36,401	1,517	34,884
Total cost of goods sold	145,336	7,768	137,568
Operating expenses:			
Research and development	322,969	291,007	31,962
Selling, general and administrative	149,455	87,061	62,394
License expense	3,529	67	3,462
Total operating expenses	475,953	378,135	97,818
Operating loss	(286,288)	(178,161)	108,127
Other income (expense), net	(2)	6,235	(6,237)
Net loss before income taxes	(286,290)	(171,926)	114,364
Benefit from income taxes	(6,631)	(28,338)	(21,707)
Net loss	\$ (279,659)	\$ (143,588)	\$ 136,071

Product Revenue, Net. Net product revenue is derived from sales of our sole commercial product, Auryxia. We distribute our product principally through a limited number of wholesale distributors as well as certain specialty pharmacy providers. We began recording product revenue on sales of Auryxia in the United States on December 12, 2018 following the consummation of the Merger. Net product revenue was \$111.1 million for the year ended December 31, 2019 and \$6.8 million for the period from December 12, 2018 through December 31, 2018. This increase as compared to the period from December 12, 2018 through December 31, 2018 was due to net product revenue associated with Auryxia, as there was no comparable net product revenue in the period from January 1, 2018 through December 11, 2018 prior to the Merger.

In September 2018, the Centers for Medicare & Medicaid Services, or CMS, decided that Auryxia would not be covered by Medicare for the IDA Indication. While this decision does not impact CMS coverage of the Hyperphosphatemia Indication, it requires all Auryxia prescriptions for Medicare patients to undergo a prior authorization to ensure their use in the Hyperphosphatemia Indication. On October 15, 2019, we filed a complaint in the United States District Court for the District of Massachusetts against CMS and the U.S. Department of Health and Human Services challenging CMS's decision that Auryxia would no longer be covered by Medicare for the IDA Indication and CMS's related decision that imposed a prior authorization requirement for Auryxia in the Hyperphosphatemia Indication. See Part I, Item 3. Legal Proceedings for further information. While we believe that the vast majority of the Medicare prescriptions written for Auryxia today are for the Hyperphosphatemia Indication and therefore will continue to be covered by Medicare with prior authorization, the prior authorization requirement and the CMS decision have had and will continue to have an adverse impact on the sales of Auryxia for the Hyperphosphatemia Indication and the IDA Indication, and ultimately on the timing and number of prescriptions and Auryxia product revenue. Sales of Auryxia for the Hyperphosphatemia Indication and the IDA Indication have been negatively impacted, and may continue to be negatively affected, as a result of the CMS decision. Even if we are successful in overturning the CMS decision, the negative impact that the original decision had on the growth of sales of Auryxia for the Hyperphosphatemia Indication and the IDA Indication will continue, although less significantly than if the CMS decision is not overturned.

License, collaboration and other revenue. License, collaboration and other revenue was \$223.9 million for the year ended December 31, 2019, compared to \$200.9 million for the year ended December 31, 2018. We recognized \$216.9 million in collaboration revenue for the year ended December 31, 2019 from our cost sharing arrangement under the Otsuka collaboration agreement for the U.S., or the Otsuka U.S. Agreement, the Otsuka collaboration agreement for certain territories outside the U.S., or the Otsuka International Agreement, as well as revenue recognized in connection with our collaboration agreement with MTPC, or the MTPC Agreement. We recognized \$200.5 million in collaboration revenue for the year ended December 31, 2018 from our cost sharing arrangement under the Otsuka U.S. Agreement, the Otsuka International Agreement, as well as revenue recognized in connection with the MTPC Agreement. The increase in revenue between the two periods was primarily attributable to an additional \$15.7 million of revenue recognized under both the Otsuka U.S. Agreement and Otsuka International Agreement and an additional \$0.7 million of revenue recognized in connection with the MTPC Agreement. The remaining variance is primarily due to an increase in license revenue relating to our sublicense agreement with JT and Torii and includes license fees and royalties on net product sales of Riona in Japan. We expect our collaboration revenue to decrease in the near term as our PRO₂TECT and INNO₂VATE studies near completion.

Cost of Goods Sold - Product. Cost of goods sold of \$108.9 million for the year ended December 31, 2019 consists primarily of costs associated with the manufacturing of Auryxia and a \$70.4 million charge related to the fair-value inventory step-up from the application of purchase accounting. Cost of goods sold of \$6.3 million for the period from December 12, 2018 through December 31, 2018 consists primarily of costs associated with the manufacturing of Auryxia and a \$4.8 million charge related to the fair-value inventory step-up from the application of purchase accounting. This increase as compared to the period from December 12, 2018 through December 31, 2018 was due to costs associated with Auryxia, as there were no comparable costs in the period from January 1, 2018 through December 11, 2018 prior to the Merger.

Cost of Goods Sold - Amortization of Intangibles. Amortization of intangibles relates to the acquired developed product rights for Auryxia. This intangible asset is being amortized over its estimated useful life of approximately nine years using a straight-line method. Amortization of intangibles for the years ended December 31, 2019 and 2018 was \$36.4 million and \$1.5 million, respectively.

Research and Development Expenses. Research and development expenses were \$323.0 million for the year ended December 31, 2019, compared to \$291.0 million for the year ended December 31, 2018. The net increase of \$32.0 million was due to the following:

	<i>(in millions)</i>
Vadadustat development expenses	(5.3)
Headcount, consulting and facilities	24.1
Other research and development	13.2
Total net increase	<u>\$ 32.0</u>

The decrease in the costs related to the development of vadadustat is primarily attributable to a decrease in external costs related to other supporting clinical and preclinical activities, as well as regulatory activities, and a decrease in costs for the Japan Phase 2 studies, which were completed in 2018. There was also a decrease in external costs for the PRO₂TECT and INNO₂VATE Phase 3 program and a decrease in costs related to the manufacture of drug substance and drug product. The overall increase in research and development expenses is primarily impacted by increases in headcount and consulting costs to support our research and development programs. Although we expect our research and development expenses in 2020 to decrease as PRO₂TECT and INNO₂VATE near top line data readout, we will continue to incur significant research and development expenses in future periods in support of our global Phase 3 program and other studies for vadadustat and development of our other product candidates.

Selling, General and Administrative Expenses. Selling, general and administrative expenses were \$149.5 million for the year ended December 31, 2019, compared to \$87.1 million for the year ended December 31, 2018. The increase of \$62.4 million was primarily due to commercialization costs associated with Auryxia as there were no comparable commercialization costs during the first eleven months of 2018, and an increase in costs to support our research and development programs. In 2020, we expect our selling, general and administrative expenses for our ongoing commercialization of Auryxia and our ongoing research and development and potential commercialization of vadadustat and other product candidates to be relatively consistent with 2019.

License Expenses. License expense related to royalties due to Auryxia relating to sales of Riona in Japan were \$3.5 million for the year ended December 31, 2019, compared to \$67,000 for the year ended December 31, 2018. The increase of \$3.4 million was primarily due to no license expense in the period from January 1, 2018 through December 11, 2018 prior to the Merger.

Other Expense, Net. Other expense, net, was \$2,000 for the year ended December 31, 2019, compared to \$6.2 million of other income, net for the year ended December 31, 2018. The change to other expense, net was primarily due to interest expense associated with our Line of Credit with Silicon Valley Bank, or SVB, in the first quarter of 2019 and interest expense associated to our Term Loans in the fourth quarter of 2019 offset by interest income from investment balances during the year ended December 31, 2019. We did not have similar expenses during the year ended December 31, 2018.

Benefit for Income Taxes. Benefit for income taxes was \$6.6 million for the year ended December 31, 2019 due to a decrease in our net deferred tax liabilities, or DTLs. During the year ended December 31, 2019, there was an increase in deferred tax assets associated with the state net operating loss generated during the period. This increase in deferred tax assets reduced our net DTLs which created a benefit from income taxes for the year ended December 31, 2019.

Comparison of the Years Ended December 31, 2018 and 2017

	Year ended December 31,		Increase (Decrease)
	2018	2017	
	(In Thousands)		
Revenues:			
Product revenue, net	\$ 6,824	\$ —	\$ 6,824
License, collaboration and other revenue	200,918	181,227	19,691
Total revenues	207,742	181,227	26,515
Cost of goods sold:			
Product	6,251	—	6,251
Amortization of intangibles	1,517	—	1,517
Total cost of goods sold	7,768	—	7,768
Operating expenses:			
Research and development	291,007	230,893	60,114
Selling, general and administrative	87,061	27,008	60,053
License expense	67	—	67
Total operating expenses	378,135	257,901	120,234
Operating loss	(178,161)	(76,674)	(101,487)
Other income, net	6,235	3,003	3,232
Net loss before income taxes	(171,926)	(73,671)	(98,255)
Benefit from income taxes	(28,338)	—	(28,338)
Net loss	\$ (143,588)	\$ (73,671)	\$ (69,917)

Revenue. Net product revenue is derived from sales of our sole commercial product, Auryxia. We began recording product revenue on sales of Auryxia in the United States on December 12, 2018 following the consummation of the Merger. During the period from December 12, 2018 through December 31, 2018 we recorded approximately \$6.8 million of net product revenue.

License, collaboration and other revenue was \$200.9 million for the year ended December 31, 2018, compared to \$181.2 million for the year ended December 31, 2017. We recognized \$200.5 million in collaboration revenue for the year ended December 31, 2018 from our cost sharing arrangement under the Otsuka U.S. Agreement, the Otsuka International Agreement, as well as revenue recognized in connection with the MTPC Agreement. We recognized \$181.2 million in collaboration revenue for the year ended December 31, 2017 from our cost sharing arrangement under the Otsuka U.S. Agreement, which commenced in December 2016, the Otsuka International Agreement, which commenced in April 2017, and the MTPC Agreement, for which the revenue recognition criteria, as required under ASC 606, began to be satisfied in the fourth quarter of 2017. The increase in revenue between the two periods was primarily attributable to an additional \$52.9 million of revenue recognized under both the Otsuka U.S. Agreement and Otsuka International Agreement, partially offset by a decrease of \$33.6 million of revenue recognized in connection with the MTPC Agreement. The remaining variance was primarily due to an increase in license revenue relating to our sublicense agreement with JT and Torii and included license fees and royalties on net product sales of Riona in Japan.

Cost of Goods Sold - Product. Cost of goods sold of \$6.3 million during the period from December 12, 2018 through December 31, 2018 consisted primarily of costs associated with the manufacturing of Auryxia and a \$4.8 million charge related to the fair-value inventory step-up from the application of purchase accounting.

Cost of Goods Sold - Amortization of Intangibles. Amortization of intangibles related to the acquired developed product rights for Auryxia. This intangible asset is being amortized over its estimated useful life of approximately 9 years using a straight-line method. Amortization of intangibles for the year ended December 31, 2018 was \$1.5 million.

Research and Development Expenses. Research and development expenses were \$291.0 million for the year ended December 31, 2018, compared to \$230.9 million for the year ended December 31, 2017. The increase of \$60.1 million was due to the following:

	<i>(in millions)</i>
PRO ₂ TECT and INNO ₂ VATE Phase 3 program	\$ 27.9
Manufacture of drug substance and drug product	16.1
Regulatory activities and other clinical and preclinical activities	15.2
FO ₂ RWARD-2 and TRILO ₂ GY-2 studies ¹	(2.9)
Japan Phase 2 studies	(9.6)
Total increase related to the continued development of vadadustat	46.7
Headcount, consulting and facilities	17.1
Other research	0.8
Janssen license fee	(1.0)
Fair value of warrants issued for Janssen license	(3.4)
Other	(0.1)
Total net increase	\$ 60.1

(1) Includes costs from the FO₂RWARD, FO₂RWARD-2, TRIL₂OGY, and TRILO₂GY-2 studies.

The increase in the costs related to the development of vadadustat was primarily attributable to an increase in external costs related to the continued advancement of the PRO₂TECT and INNO₂VATE Phase 3 program, including ongoing enrollment, manufacture of drug substance and drug product in support of the global Phase 3 program, and regulatory activities as well as other clinical and preclinical activities. This increase in costs related to the development of vadadustat was partially offset by a decrease in costs related to the FO₂RWARD, TRILO₂GY, and Japan Phase 2 studies. The increase in research and development expenses were further impacted by increases in headcount and consulting costs to support our expanding research and development programs.

Selling, General and Administrative Expenses. Selling, general and administrative expenses were \$87.1 million for the year ended December 31, 2018, compared to \$27.0 million for the year ended December 31, 2017. The increase of \$60.1 million was primarily due to an increase in legal and other professional fees related to the Merger, including \$13.4 million attributed to the fair value of the 4,000,000 Additional Shares issued to Baupost, and an increase in costs to support our research and development programs, including headcount and compensation-related costs.

License Expenses. For the year ended December 31, 2018, we recognized approximately \$67,000 in license expense related to royalties from sales of Riona in Japan.

Other Income, Net. Other income, net, was \$6.2 million for the year ended December 31, 2018, compared to \$3.0 million for the year ended December 31, 2017. Other income, net for the year ended December 31, 2018, was primarily comprised of interest income caused by higher average interest rates on our investments during 2018.

Benefit for Income Taxes. Benefit for income taxes was \$28.3 million for the year ended December 31, 2018 due to the release of a portion of our valuation allowance as the DTLs recorded as part of purchase accounting will provide a source of income that allowed us to conclude that certain of our deferred tax assets are realizable. The release of valuation allowance creates a tax benefit in the consolidated statement of operations and comprehensive loss.

Liquidity and Capital Resources

We have incurred losses and cumulative negative cash flows from operations since our inception in February 2007, and as of December 31, 2019, we had an accumulated deficit of \$794.1 million. We anticipate that we will continue to incur losses for the foreseeable future. We expect to continue to incur additional research and development and selling, general and administrative expenses and, as a result, we will need additional capital to fund our operations, which we expect to raise through public or private equity or debt transactions, payments from our collaborators, royalty transactions, strategic transactions, or a combination of these approaches.

We have funded our operations principally through sales of our common stock, payments received from our collaboration partners, debt, and following the Merger, product sales. As of December 31, 2019, we had cash and cash equivalents and available for sale securities of approximately \$147.7 million. Cash in excess of immediate requirements is invested in accordance with our investment policy, primarily with a view to liquidity and capital preservation. Accordingly, available for sale securities, consisting principally of corporate and government debt securities stated at fair value, are also available as a source of liquidity.

Cash Flows

The following table sets forth the primary sources and uses of cash for each of the periods set forth below:

	Year ended December 31,		
	2019	2018	2017
	<i>(In Thousands)</i>		
Net cash provided by (used in):			
Operating activities	\$ (257,441)	\$ (97,494)	\$ (56,159)
Investing activities	211,176	36,594	(177,260)
Financing activities	88,970	96,562	116,240
Net increase/(decrease) in cash, cash equivalents and restricted cash	<u>\$ 42,705</u>	<u>\$ 35,662</u>	<u>\$ (117,179)</u>

Operating Activities. Net cash used in operating activities in all periods resulted primarily from our net losses adjusted for non-cash charges and changes in the components of working capital. Net cash used in operating activities during the year ended December 31, 2019 of \$257.4 million was largely driven by timing of payments on our Phase 3 development program for vadadustat, payments for inventory and merger-related liabilities. These payments were partially offset by adjustments for non-cash items, including the fair value write-up of inventory sold of \$70.4 million, amortization of intangibles of \$36.4 million, and stock-based compensation expense of \$11.9 million. Net cash used in operating activities during the year ended December 31, 2018 of \$97.5 million was largely driven by our Phase 3 development program for vadadustat, partially offset by receipt of cash from collaboration agreements. Net cash used in operating activities during the year ended December 31, 2017 of \$56.2 million was largely driven by our Phase 3 development program for vadadustat, partially offset by receipt of cash from collaboration agreements, including a \$73.0 million up-front payment under the Otsuka International Agreement.

Investing Activities. During the year ended December 31, 2019, net cash provided by investing activities of \$211.2 million was comprised primarily of proceeds from the maturities of available for sale securities of \$153.1 million and proceeds from the sales of available for sale securities of \$64.7 million, partially offset by purchases of equipment of \$6.7 million. Net cash provided by investing activities during the year ended December 31, 2018 of \$36.6 million was comprised primarily from the sale and maturities of available for sale securities, partially offset by purchases of available for sale securities, purchases of equipment and acquisition of the business, net of cash acquired. Net cash used in investing activities during the year ended December 31, 2017 of \$177.3 million was comprised primarily from the purchases of available for sale securities of \$330.6 million, partially offset by sale of and maturities of available for sale securities and purchases of equipment.

Financing Activities. During the years ended December 31, 2019, 2018 and 2017 our net cash provided by financing activities was \$89.0 million, \$96.6 million and \$116.2 million, respectively. Net cash provided by financing activities for the years ended December 31, 2019, 2018 and 2017 consisted primarily of net proceeds from the issuance of debt, net proceeds from the public issuance of common stock, proceeds from the exercise of stock options and proceeds from the sale of stock under our employee stock purchase plan, partially offset by payments on loans payable.

Operating Capital Requirements

We have one product, Auryxia, approved for commercial sale, but have not generated, and may not generate, enough product revenue from the sale of Auryxia to realize net profits from product sales. We anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek marketing approvals for, our product candidates. We are subject to all risks incident to the development and commercialization of novel therapeutics, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. We expect to continue to incur additional costs associated with operating as a public company and we anticipate that we will need substantial additional funding in connection with our continuing operations.

We ended 2019 with cash, cash equivalents and available for sale securities of \$147.7 million. At the inception of our collaboration agreements with Otsuka and MTPC, our collaborators committed to an aggregate of approximately \$573.0 million or more in cost-share funding, of which we received approximately \$272.0 million at the onset of the collaborations, and the remainder of which we generally continue to receive on a quarterly prepaid basis, and through license payments. We expect our cash resources and the receipt of a \$15.0 million regulatory milestone from MTPC, assuming approval of vadadustat in Japan, to fund our current operating plan well into 2021.

We will require additional capital for the development and potential commercialization of our existing product candidates, further commercialization of Auryxia and would need to raise additional funds to pursue development activities related to additional product candidates. If and until we can generate a sufficient amount of product revenue, we expect to finance future cash needs through public or private equity or debt transactions, payments from our collaborators, royalty transactions, strategic transactions, or a combination of these approaches. We have based these estimates on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Furthermore, our development and regulatory milestones may not be achieved, we may not receive the anticipated funding from our collaboration partners, and we may not secure other sources of financing. Additional funds may not be available to us on acceptable terms or at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the commercialization of our product or the development or commercialization of one or more of our product candidates. If we raise additional funds through the issuance of additional debt or equity securities, it could result in dilution to our existing stockholders or increased fixed payment obligations, and any such securities may have rights senior to those of our common stock. Any of these events could significantly harm our business, financial condition and prospects.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors. We have based this estimate on assumptions that may be substantially different than actual results, and we could utilize our available capital resources sooner than we currently expect. Our future funding requirements, both near- and long-term, will depend on many factors including, but not limited to, those described under Part I, Item 1A. Risk Factors.

If we cannot expand our operations or otherwise capitalize on our business opportunities because we lack sufficient capital, our business, financial condition and results of operations could be materially adversely affected.

Contractual Obligations and Commitments

At December 31, 2019, our future contractual obligations are as follows:

	Payments due by period (in thousands)				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Operating Lease Obligations	\$ 39,648	\$ 6,568	\$ 13,799	\$ 10,463	\$ 8,818
Manufacturing Agreements	196,092	\$ 44,351	\$ 83,008	\$ 35,733	\$ 33,000
Debt Obligations	110,208	7,727	20,608	81,873	—
Total	<u>\$ 345,948</u>	<u>\$ 58,646</u>	<u>\$ 117,415</u>	<u>\$ 128,069</u>	<u>\$ 41,818</u>

Leases

We lease approximately 65,167 square feet of office and lab space in Cambridge, Massachusetts under a lease which was most recently amended in April 2018, collectively the Cambridge Lease. Under the Third Amendment to the Cambridge Lease, or the Third Amendment, executed in July 2016, total monthly lease payments under the initial base rent were approximately \$242,000 and are subject to annual rent escalations. In addition to such annual rent escalations, base rent payments for a portion of said premises commenced on January 1, 2017 in the monthly amount of approximately \$22,000. The Fourth Amendment to the Cambridge Lease, executed in May 2017, provided additional storage space to us and did not impact rent payments. In April 2018, we entered into a Fifth Amendment to the Cambridge Lease, or the Fifth Amendment, for an additional 19,805 square feet of office space on the 12th floor. Monthly lease payments for the existing 45,362 square feet of office and lab space, under the Third Amendment, remain unchanged. The new space leased by us was delivered in September 2018 and additional monthly lease payments of approximately \$135,000 commenced in February 2019 and are subject to annual rent escalations, which commenced in September 2019.

Additionally, as a result of the Merger, we have a lease for 27,300 square feet of office space in Boston, Massachusetts, or the Boston Lease, which expires on February 27, 2023. The total monthly lease payments under the base rent are approximately \$136,000 and are subject to annual rent escalations.

In September 2019, Keryx entered into an agreement to sublease the Boston office space to Foundation Medicine, Inc., or Foundation. The sublease is subject and subordinate to the Boston Lease between Keryx and the landlord. The term of the sublease commenced on October 16, 2019, upon receipt of the required consent from the landlord for the sublease agreement, and expires on February 27, 2023. Foundation is obligated to pay Keryx rent that approximates the rent due from us to Keryx's landlord with respect to the Boston Lease. Keryx continues to be obligated for all payment terms pursuant to the Boston Lease, and we will guaranty Keryx's obligations under the sublease.

Term Loans

On November 11, 2019, Akebia, with Keryx as guarantor, entered into a loan agreement, or the Loan Agreement, with BioPharma Credit PLC as collateral agent and a lender, or the Collateral Agent, and BioPharma Credit Investments V (Master) LP as a lender, collectively with the Collateral Agent, Pharmakon, pursuant to which term loans in an aggregate principal amount of \$100.0 million were made available to us in two tranches, subject to certain terms and conditions, or the Term Loans. The first tranche of \$80.0 million, or Tranche A, was drawn on November 25, 2019, or the Tranche A Funding Date. The second tranche, available until December 31, 2020, allows us to borrow, at our option, an additional \$20.0 million, or Tranche B, subject to the satisfaction of customary conditions. The date on which Tranche B is drawn, the Tranche B Funding Date, and each of the Tranche A Funding Date and the Tranche B Funding Date, a Funding Date.

Proceeds from the Term Loans may be used for general corporate purposes. We and Keryx entered into a Guaranty and Security Agreement with the Collateral Agent, or the Guaranty and Security Agreement, on the Tranche A Funding Date. Pursuant to the Guaranty and Security Agreement, our obligations under the Term Loans are unconditionally guaranteed by Keryx, or the Guarantee. Additionally, our and Keryx's obligations under the Term Loans and the Guarantee are secured by a first priority lien on certain assets of ours and Keryx's, including Auryxia and certain related assets, cash, and certain equity interests held by us and Keryx, collectively the Collateral.

The Term Loans bear interest at a floating rate per annum equal to the three-month LIBOR rate plus 7.50%, subject to a 2.00% LIBOR floor and a 3.35% LIBOR cap, payable quarterly in arrears. The Term Loans will mature on the fifth anniversary of the Tranche A Funding Date, or the Maturity Date. We will repay the principal under the Term Loans in equal quarterly payments starting on the 33rd-month anniversary of the applicable Funding Date or, if certain conditions are met, it will have the option to repay the principal in equal quarterly payments starting on the 48th-month anniversary of the applicable Funding Date, or collectively the Amortization Schedule. Under certain circumstances, unless certain liquidity conditions are met, the Maturity Date may decrease by up to one year, and the Amortization Schedule may correspondingly commence up to one year earlier.

On the Tranche A Funding Date, we paid to Pharmakon a facility fee equal to 2.00% of the aggregate principal amount of the Term Loans, or \$2.0 million, in addition to other expenses incurred by Pharmakon and reimbursed by us, or Lender Expenses. The Tranche A draw was \$77.3 million, net of facility fee, Lender Expenses and issuance costs. The Loan Agreement permits voluntary prepayment at any time in whole or in part, subject to a prepayment premium. The prepayment premium would be 2.00% of the principal amount being prepaid prior to the third anniversary of the applicable Funding Date, 1.00% on or after the third anniversary, but prior to the fourth anniversary, of the applicable Funding Date, and 0.50% on or after the fourth anniversary of the applicable Funding Date but prior to the Maturity Date, and a make-whole premium on or prior to the second anniversary of the applicable Funding Date in an amount equal to foregone interest through the second anniversary of the applicable Funding Date. A change of control triggers a mandatory prepayment of the Term Loans.

The Loan Agreement contains customary representations, warranties, events of default and covenants of ours and our subsidiaries, including maintaining, on an annual basis, a minimum liquidity threshold starting in 2021, and on a quarterly basis, a minimum net sales threshold for Auryxia starting in the fourth quarter of 2020. If an event of default occurs and is continuing under the Loan Agreement, the Collateral Agent is entitled to take enforcement action, including acceleration of amounts due under the Loan Agreement. Under certain circumstances, a default interest rate will apply on all outstanding obligations during the occurrence and continuance of an event of default. As of December 31, 2019, we determined that no events of default had occurred.

We assessed the terms and features of the Loan Agreement in order to identify any potential embedded features that would require bifurcation or any beneficial conversion feature. As part of this analysis, we assessed the economic characteristics and risks of the Loan Agreement, including put and call features. The terms and features assessed include a potential extension to the interest-only period dependent on both no event of default having occurred and continuing and on us achieving certain regulatory and revenue conditions. We also assessed the acceleration of the obligations under the Loan Agreement under an event of default. In addition, under certain circumstances, a default interest rate will apply on all outstanding obligations during the occurrence and continuance of an event of default. In accordance with ASC 815, we concluded that these features are not clearly and closely related to the host instrument, and represent a single compound derivative that is required to be re-measured at fair value on a quarterly basis.

The foregoing description of the Loan Agreement does not purport to be complete and is qualified in its entirety by reference to the Loan Agreement, a copy of which is filed as an exhibit to this Annual Report on Form 10-K for the year ending December 31, 2019.

Manufacturing Agreements

As a result of the Merger, our contractual obligations include Keryx's commercial supply agreements with BioVectra Inc., or BioVectra, and Siegfried Evionnaz SA, or Siegfried, to supply commercial drug substance for Auryxia.

Pursuant to the Manufacture and Supply Agreement with BioVectra and the Product Manufacture and Supply and Facility Construction Agreement with BioVectra, collectively the BioVectra Agreement, we have agreed to purchase a minimum quantity of drug substance of Auryxia at predetermined prices. The price per kilogram will decrease with an increase in quantity above the minimum purchase quantity. In addition, the BioVectra Agreement contained contingent milestone payments for capital developments in connection with construction of an expansion of the site of the BioVectra production facility for the manufacture of drug substance for Auryxia. These milestone payments were achieved by BioVectra and paid and fully recorded prior to the Merger. The term of the BioVectra Agreement expires in late 2026, after which, it automatically renews for specified terms until terminated. We have the right to terminate the BioVectra Agreement prior to the contract term, which could result in an early termination fee. As of December 31, 2019, we are required to purchase a minimum quantity of drug substance for Auryxia annually at a total cost of approximately \$135.3 million through the year ended December 31, 2026.

As part of purchase accounting, we identified an executory contract in the supply agreement between Keryx and BioVectra, which includes future firm purchase commitments. This executory contract was deemed to have an off-market element related to the amount of purchase commitments that exceed the current forecast. As a result, we recorded a liability of \$29.5 million in purchase accounting as of the acquisition date for the preliminary fair value of the off-market element. Through December 31, 2019, we recorded \$0.7 million in accretion expense related to the present value discount associated with this liability.

Pursuant to the Siegfried Master Manufacturing Services and Supply Agreement, or the Siegfried Agreement, we have agreed to purchase a minimum quantity of drug substance of Auryxia at predetermined prices. The price per kilogram will decrease with an increase in quantity above the minimum purchase quantity. The term of the Siegfried Agreement expires on December 31, 2021, after which, it automatically renews for one-year terms until terminated. The Siegfried Agreement provides us with certain termination rights prior to December 31, 2021. As of December 31, 2019, we are required to purchase a minimum quantity of drug substance for Auryxia annually at a total cost of approximately \$60.8 million through the year ended December 31, 2021.

On April 9, 2019, we entered into a Supply Agreement with Esteve Química, S.A., or Esteve, or the Esteve Agreement. The Esteve Agreement includes the terms and conditions under which Esteve will manufacture vadamstat drug substance, or API, for commercial use.

Pursuant to the Esteve Agreement, we shall provide rolling forecasts to Esteve on a quarterly basis, or the Forecast. The Forecast shall reflect our needs for API produced by Esteve over a certain number of months, represented as a quantity of API per calendar quarter. The parties have agreed to a volume-based pricing structure under the Esteve Agreement. The Esteve Agreement has an initial term of four years, beginning April 9, 2019 and ending April 9, 2023. Subsequent to December 31, 2019, we have a minimum commitment with Esteve for \$5.8 million through the first quarter of 2021.

Other Third Party Contracts

Under our agreement with IQVIA to provide contract research organization services for the PRO₂TTECT and INNO₂VATE programs, the total remaining contract costs as of December 31, 2019 were approximately \$34.9 million, of which Otsuka reimburses a significant portion back to us. The estimated period of performance for the committed work with IQVIA is through the end of 2020. We also contract with various other organizations to conduct research and development activities with remaining contract costs to us of approximately \$61.4 million as of December 31, 2019. The scope of the services under these research and development contracts can be modified and the contracts cancelled by us upon written notice, and therefore not included in the table of contractual obligations and commitments. In some instances, the contracts may be cancelled by the third party upon written notice.

Off-Balance Sheet Arrangements

As of December 31, 2019, we did not have any off-balance sheet arrangements as defined in the rules and regulations of the SEC.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. On an ongoing basis, we evaluate our estimates and judgments, including those related to revenue, prepaid and accrued research and development expenses and stock-based compensation. We base our estimates on historical experience, known trends and events, and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. In making estimates and judgments, management employs critical accounting policies.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K, we believe the following accounting policies to be most critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Derivative Financial Instruments

We account for warrants and other derivative financial instruments as either equity or liabilities in accordance with ASC Topic 815, *Derivatives and Hedging*, or ASC 815, based upon the characteristics and provisions of each instrument. Warrants classified as equity are recorded at fair value as of the date of issuance on our consolidated balance sheets and no further adjustments to their valuation are made. Warrants classified as derivative liabilities and other derivative financial instruments that require separate accounting as liabilities are recorded on our consolidated balance sheets at their fair value on the date of issuance and will be revalued on each subsequent balance sheet date until such instruments are exercised or expire, with any changes in the fair value between reporting periods recorded as other income or expense. The warrant issued by us in connection with the Janssen Pharmaceutica NV Research and License Agreement, the Janssen Agreement, is classified as equity in our consolidated balance sheet. (See Note 12 to our consolidated financial statements in Part 2, Item 8. Financial Statements and Supplementary Data). The derivative liability recorded in connection with the Loan Agreement with Pharmakon is classified as a liability in our consolidated balance sheet. (See Note 11 to our consolidated financial statements in Part 2, Item 8. Financial Statements and Supplementary Data).

Inventory

We value our inventories at the lower-of-cost or net realizable value. We determine the cost of our inventories, which includes amounts related to materials and manufacturing overhead, on a first-in, first-out basis. We classify inventory costs as long-term, in other assets in our consolidated balance sheets, when we expect to utilize the inventory beyond our normal operating cycle.

Prior to the regulatory approval of our product candidates, we incur expenses for the manufacture of material that could potentially be available to support the commercial launch of our products. Until the first reporting period when regulatory approval has been received or is otherwise considered probable and the future economic benefit is expected to be realized, we record all such costs as research and development expense. Inventory used in clinical trials is also expensed as research and development expense, when selected for such use. Inventory that can be used in either the production of clinical or commercial products is expensed as research and development costs when identified for use in a clinical manufacturing campaign.

We perform an assessment of the recoverability of capitalized inventory during each reporting period, and write down any excess and obsolete inventory to our net realizable value in the period in which the impairment is first identified. Such impairment charges, should they occur, are recorded as a component of cost of product sales in the consolidated statements of operations and comprehensive loss. The determination of whether inventory costs will be realizable requires the use of estimates by management. If actual market conditions are less favorable than projected by management, additional write-downs of inventory may be required. Additionally, our product is subject to strict quality control and monitoring that we perform throughout the manufacturing process. In the event that certain batches or units of product no longer meet quality specifications, we will record a charge to cost of product sales to write-down any unmarketable inventory to its estimated net realizable value. In all cases, product inventory is carried at the lower of cost or its estimated net realizable value.

Debt

We perform an assessment of all embedded features of a debt instrument to determine if (1) such features should be bifurcated and separately accounted for, and (2) if bifurcation requirements are met, whether such features should be classified and accounted for as equity or liability instruments. If the embedded feature meets the requirements to be bifurcated and accounted for as a liability, the fair value of the embedded feature is measured initially, included as a liability on the consolidated balance sheet, and re-measured to fair value at each reporting period. Any changes in fair value are recorded in the consolidated statement of operations. We monitor, on an ongoing basis, whether events or circumstances could give rise to a change in the classification of embedded features.

Revenue

We generate revenues primarily from sales of Auryxia, see Note 3 to our consolidated financial statements in Part II, Item 8. Financial Statements and Supplementary Data, and from our collaborations with MTPC and Otsuka, see Note 4 to our consolidated financial statements in Part II, Item 8. Financial Statements and Supplementary Data. We recognize revenue in accordance with ASC 606, which applies to all contracts with customers, except for contracts that are within the scope of other standards. Under ASC 606, we recognize revenue when our customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements that we determine are within the scope of ASC 606, we perform the following five steps:

- (i) identify the contract(s) with a customer;

- (ii) identify the performance obligations in the contract;
- (iii) determine the transaction price;
- (iv) allocate the transaction price to the performance obligations in the contract; and
- (v) recognize revenue when (or as) the entity satisfies a performance obligation.

We only apply the five-step model to contracts when it is probable that the entity will collect the consideration we are entitled to in exchange for the goods or services we transfer to the customer. At contract inception, once the contract is determined to be within the scope of ASC 606, we assess the goods or services promised within each contract and determine those that are performance obligations, and assess whether each promised good or service is distinct. We then recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Product Revenue, Net

We sell Auryxia in the United States, primarily to wholesale distributors as well as certain specialty pharmacy providers, collectively the Customers. These Customers resell our product to health care providers and patients. In addition to distribution agreements with Customers, we enter into arrangements with health care providers and payors that provide for government-mandated and/or privately-negotiated rebates, chargebacks, and discounts with respect to the purchase of our product.

We recognize revenue on product sales when the Customer obtains control of our product, which occurs at a point in time, typically upon delivery to the Customer. We expense incremental costs of obtaining a contract as and when incurred if the expected amortization period of the asset that we would have recognized is one year or less.

Reserves for Variable Consideration

Revenue from product sales is recorded at the net sales price (transaction price), which includes estimates of variable consideration for which reserves are established and which result from discounts, returns, chargebacks, rebates, co-pay assistance and other allowances that are offered within contracts between us and our Customers, health care providers, payors and other indirect customers relating to our sales of our products. These reserves are based on the amounts earned or to be claimed on the related sales and are classified as reductions of accounts receivable (if the amount will be credited to the Customer) or a current liability (if the amount is payable to a Customer or a party other than a Customer). When appropriate, these estimates take into consideration a range of possible outcomes which are probability-weighted in accordance with the expected value method in ASC 606 for relevant factors such as our historical experience, current contractual and statutory requirements, specific known market events and trends, industry data, and forecasted customer buying and payment patterns. Overall, these reserves reflect our best estimates of the amount of consideration to which we are entitled based on the terms of the respective underlying contracts.

The amount of variable consideration that is included in the transaction price may be constrained, and is included in the net sales price only to the extent that it is probable that a significant reversal in the amount of the cumulative revenue recognized will not occur in a future period. Actual amounts of consideration ultimately received may differ from our estimates. If actual results in the future vary from our estimates, we will adjust these estimates, which would affect net product revenue and earnings in the period such variances become known.

Trade Discounts and Allowances: We generally provide Customers with discounts that include incentive fees that are explicitly stated in our contracts and are recorded as a reduction of revenue in the period the related product revenue is recognized. In addition, we compensate (through trade discounts and allowances) our Customers for sales order management, data, and distribution services. However, we have determined such services received to date are not distinct from our sale of products to the Customer and, therefore, these payments have been recorded as a reduction of revenue within the statement of operations and comprehensive loss through December 31, 2019. We record a corresponding reduction to accounts receivable (if the trade discount and/or allowance will be credited to the Customer) or an increase to accrued expense (if the trade discount and/or allowance is payable to a Customer) on the consolidated balance sheets.

Product Returns: Consistent with industry practice, we generally offer Customers a limited right of return which allows for product return when the product expiry is within an allowable window. This right of return lapses once provided to a patient. We estimate the amount of our product sales that may be returned by our Customers and record this estimate as a reduction of revenue in the period the related product revenue is recognized. We currently estimate product return reserve using available industry data and our own historical sales information, including our visibility into the inventory remaining in the distribution channel.

Provider Chargebacks and Discounts: Chargebacks for fees and discounts to providers represent the estimated obligations resulting from contractual commitments to sell products to qualified healthcare providers at prices lower than the list prices charged to Customers who directly purchase the product from us. Customers charge us for the difference between what they pay for the product and the ultimate selling price to the qualified healthcare providers. These reserves are established in the same period that the related

revenue is recognized, resulting in a reduction of product revenue and accounts receivable. Chargeback amounts are generally determined at the time of resale to the qualified healthcare provider by Customers, and we generally issue credits for such amounts within a few weeks of the Customer's resale of the product. Reserves for chargebacks consist of credits that we expect to issue for units that remain in the distribution channel at each reporting period end that we expect will be sold to qualified healthcare providers, and chargebacks that Customers have claimed but for which we have not yet issued a credit.

Commercial and Medicare Part D Rebates: We contract with various commercial payor organizations, primarily health insurance companies and pharmacy benefit managers, for the payment of rebates with respect to utilization of our products. We estimate the rebates for commercial and Medicare Part D payors based upon (i) our contracts with the payors and (ii) information obtained from our Customers and other third parties regarding the payor mix for Auryxia. We estimate these rebates and record such estimates in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability.

Other Government Rebates: We are subject to discount obligations under state Medicaid programs and other government programs. We estimate Medicaid and other government programs rebates based upon a range of possible outcomes that are probability-weighted for the estimated payor mix. These reserves are recorded in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability which is included in accrued expenses and other current liabilities on the consolidated balance sheets. For Medicare, we also estimate the number of patients in the prescription drug coverage gap for whom we will owe an additional liability under the Medicare Part D program. Our liability for these rebates consists of invoices received for claims from prior quarters that have not been paid or for which an invoice has not yet been received, estimates of claims for the current quarter, and estimated future claims that will be made for product that has been recognized as revenue, but which remains in the distribution channel at the end of each reporting period.

Other Incentives: Other incentives that we offer include voluntary patient assistance programs such as our co-pay assistance program, which are intended to provide financial assistance to qualified commercially insured patients with prescription drug co-payments required by payors. The calculation of the accrual for co-pay assistance is based on actual claims processed during a given period, as well as historical utilization data to estimate the amount we expect to receive associated with product that has been recognized as revenue, but remains in the distribution channel at the end of each reporting period.

Collaboration Revenues

We enter into out-license and collaboration agreements which are within the scope of ASC 606, under which we license certain rights to our product candidates to third parties. The terms of these arrangements typically include payment to us of one or more of the following: non-refundable, up-front license fees; development, regulatory, and commercial milestone payments; payments for manufacturing supply services we provide through our contract manufacturers; and royalties on net sales of licensed products. Each of these payments may result in license, collaboration and other revenue, except for revenues from royalties on net sales of licensed products, which are classified as royalty revenues.

In determining the appropriate amount of revenue to be recognized as we fulfill our obligations under each of our agreements, we implement the five-step model noted above. As part of the accounting for these arrangements, we must develop assumptions that require judgment to determine whether the individual promises represent separate performance obligations or as a combined performance obligation, and to determine the stand-alone selling price for each performance obligation identified in the contract. A deliverable represents a separate performance obligation if both of the following criteria are met: (i) the customer can benefit from the good or service either on our own or together with other resources that are readily available to the customer, and (ii) the entity's promise to transfer the good or service to the customer is separately identifiable from other promises in the contract. We use key assumptions to determine the stand-alone selling price, which may include forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates, and probabilities of technical and regulatory success. With regard to the MTPC and Otsuka collaboration agreements, we recognize revenue related to amounts allocated to the identified performance obligation on a proportional performance basis as the underlying services are performed.

Licenses of Intellectual Property

If the license to our intellectual property is determined to be distinct from the other performance obligations identified in an out-license and collaboration arrangement, we recognize revenue from non-refundable, up-front fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. For licenses that are bundled with other promises, we utilize judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue from non-refundable, up-front fees. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

Milestone Payments

At the inception of each arrangement that includes development milestone payments, we evaluate whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price using the most likely amount method. We evaluate factors such as the scientific, clinical, regulatory, commercial, and other risks that must be overcome to assess the milestone as probable of being achieved. There is considerable judgment involved in determining whether a milestone is probable of being reached at each specific reporting period. Milestone payments that are not within our control or the customer, such as regulatory approvals, are not considered probable of being achieved until those approvals are received. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which we recognize revenues as, or when, the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, we will re-evaluate the probability of achievement of such development milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect collaboration revenue in the period of adjustment.

Manufacturing Supply Services

Arrangements that include a promise for future supply of drug substance or drug product for either clinical development or commercial supply at the licensee's discretion are generally considered as options. We assess if these options provide a material right to the licensee and if so, they are accounted for as separate performance obligations. If we are entitled to additional payments when the licensee exercises these options, any additional payments are recorded in license, collaboration and other revenues when the licensee obtains control of the goods, which is upon delivery.

Royalties

We will recognize sales-based royalties, including milestone payments based on the level of sales, at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). We receive royalty payments from JT and Torii, based on net sales of Riona in Japan.

Collaborative Arrangements

We record the elements of our collaboration agreements that represent joint operating activities in accordance with ASC Topic 808, *Collaborative Arrangements* (ASC 808). Accordingly, the elements of the collaboration agreements that represent activities in which both parties are active participants and to which both parties are exposed to the significant risks and rewards that are dependent on the commercial success of the activities are recorded as collaborative arrangements. We consider the guidance in ASC 606-10-15, *Revenue from Contracts with Customers – Scope and Scope Exceptions*, in determining the appropriate treatment for the transactions between us and our collaborative partner and the transactions between us and third parties. Generally, the classification of transactions under the collaborative arrangements is determined based on the nature and contractual terms of the arrangement along with the nature of the operations of the participants. Therefore, we recognize our allocation of the shared costs incurred with respect to the jointly conducted medical affairs and commercialization and non-promotional activities under the Otsuka U.S. Agreement as a component of the related expense in the period incurred. During the years ended December 31, 2019 and 2018, we incurred approximately \$1.8 million and \$1.2 million, respectively, of costs related to the cost-sharing provisions of the Otsuka U.S. Agreement, as defined below in Note 4 to our consolidated financial statements in Part II, Item 8. Financial Statements and Supplementary Data, of which approximately \$0.7 million and \$0.5 million are reimbursable by Otsuka and recorded as a reduction to research and development expense during each of the years ended December 31, 2019 and 2018, respectively. During the year ended December 31, 2019 and 2018, Otsuka incurred approximately \$1.9 million and \$1.1 million, respectively, of costs related to the cost-sharing provisions of the Otsuka U.S. Agreement, of which approximately \$1.0 million and \$0.5 million are reimbursable by us and recorded as an increase to research and development expense during the years ended December 31, 2019 and 2018. To the extent product revenue is generated from the collaboration, we recognize our share of the net sales on a gross basis if it is deemed to be the principal in the transactions with customers, or on a net basis if it is instead deemed to be the agent in the transactions with customers, consistent with the guidance in ASC 606.

Intangible Assets

We maintain a definite-lived intangible asset related to developed product rights for Auryxia, which was acquired on December 12, 2018 as part of the Merger.

Intangible assets are initially recorded at fair value and stated net of accumulated amortization and impairments. We amortize our intangible assets that have finite lives using either the straight-line method, or if reliably determinable, based on the pattern in which

the economic benefit of the asset is expected to be utilized. Amortization for our intangible asset is recorded over its estimated useful life of nine years.

We review intangible assets subject to amortization to determine if any adverse conditions exist or a change in circumstances has occurred that would indicate impairment or a change in the remaining useful life. If an impairment indicator exists, we perform a recoverability test by comparing the sum of the estimated undiscounted cash flows of the intangible asset and asset group to its carrying value on the consolidated balance sheet. If the carrying value of the intangible asset exceeds the undiscounted cash flows used in the recoverability test, we will write the carrying value down to the fair value in the period identified. We calculate the fair value of intangible assets as the present value of estimated future cash flows expected to be generated from the intangible asset using a risk-adjusted discount rate. In determining estimated future cash flows associated with our intangible assets, we use market participant assumptions pursuant to ASC Topic 820, *Fair Value Measurements and Disclosures* (ASC 820).

Income Taxes

Income taxes are recorded in accordance with FASB Topic 740, *Income Taxes*, or ASC 740, which provides for deferred taxes using an asset and liability approach. We recognize deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are provided, if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. All deferred taxes as of December 31, 2019 and 2018 are classified as noncurrent within the income tax provision (see Note 14 to our consolidated financial statements in Part 2, Item 8. Financial Statements and Supplementary Data).

We account for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, we recognize the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position, as well as consideration of the available facts and circumstances. As of December 31, 2019 and 2018, we do not have any significant uncertain tax positions. We recognize interest and penalties related to uncertain tax positions in income tax expense.

Stock-Based Compensation

We account for stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation*, or ASC 718. ASC 718 requires all stock-based payments to employees and non-employees, including grants of stock options, restricted stock, restricted stock units, or RSUs, and modifications to existing stock awards, to be recognized in the statements of operations and comprehensive loss based on their fair values. Our stock-based awards are comprised of stock options and RSUs. We estimate the fair value of options granted using the Black-Scholes option pricing model. We use a blend of our stock price and the quoted market price of comparable public companies to determine the fair value of restricted stock awards and common stock awards.

The Black-Scholes option pricing model requires the input of certain subjective assumptions, including (a) the expected stock price volatility, (b) the calculation of expected term of the award, (c) the risk-free interest rate and (d) expected dividends. Due to the lack of company-specific historical and implied volatility data for trading our stock in the public market, we have based our estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. The historical volatility is calculated based on a period of time commensurate with the expected term assumption. The computation of expected volatility is based on the historical volatility of a representative group of companies with similar characteristics to us, including stage of product development and life science industry focus. During 2017, we began to estimate our volatility by using a blend of our stock price history for the length of time we have market data for our stock and the historical volatility of similar public companies for the expected term of each grant. We are a commercial-stage biopharmaceutical company and the representative group of companies has certain similar characteristics to us. We believe the group selected has sufficient similar economic and industry characteristics and includes companies that are most representative of us. We use the simplified method as prescribed by the SEC Staff Accounting Bulletin No. 107, *Share-Based Payment*, to calculate the expected term for options granted to employees as it does not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term. The expected term is applied to the stock option grant group as a whole, as we do not expect substantially different exercise or post-vesting termination behavior among our employee population. For options granted to non-employees, we utilize the contractual term of the arrangement as the basis for the expected term assumption. The risk-free interest rate is based on a treasury instrument whose term is consistent with the expected life of the stock options. The expected dividend yield is assumed to be zero as we have never paid dividends and have no current plans to pay any dividends on our common stock, which is similar to our peer group.

Our stock-based awards are subject to either service- or performance-based vesting conditions. Compensation expense related to awards to employees and non-employees with service-based vesting conditions is recognized on a straight-line basis based on the

grant date fair value over the associated service period of the award, which is generally the vesting term, and is adjusted for pre-vesting forfeitures in the period in which the forfeitures occur. Compensation expense related to awards to employees and non-employees with performance-based vesting conditions is recognized based on the grant date fair value over the requisite service period using the accelerated attribution method to the extent achievement of the performance condition is probable.

For awards with performance conditions in which the award does not vest unless the performance condition is met, we recognize expense if, and to the extent that, we estimate that achievement of the performance condition is probable. If we conclude that vesting is probable, we recognize expense from the date we reach this conclusion through the estimated vesting date.

Recent Accounting Pronouncements

For additional discussion of recent accounting pronouncements, please refer to *New Accounting Pronouncements – Recently Adopted* and *New Accounting Pronouncements – Not Yet Adopted* included within Note 2 to our consolidated financial statements in Part 2, Item 8. Financial Statements and Supplementary Data.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

We are exposed to market risk related to changes in interest rates. As of December 31, 2019 and 2018, we had cash and cash equivalents and available for sale securities of \$147.7 million and \$321.6 million, respectively, primarily money market mutual funds consisting of U.S. government debt securities, certificates of deposit and corporate debt securities. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments are primarily in short-term securities. Our investments are subject to interest rate risk and will fall in value if market interest rates increase. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 100 basis point change in interest rates would not have a material effect on the fair market value of our portfolio.

Item 8. Financial Statements and Supplementary Data

Akebia Therapeutics, Inc.

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders of Akebia Therapeutics, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Akebia Therapeutics, Inc. (the “Company”) as of December 31, 2019 and 2018, the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 12, 2020 expressed an adverse opinion thereon.

Adoption of ASU No. 2016-02

As discussed in Note 2 to the consolidated financial statements, the Company changed its method of accounting for leases in the year ended December 31, 2019 due to the adoption of ASU No. 2016-02, Leases (Topic 842), and the related amendments.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2013.

Boston, Massachusetts
March 12, 2020

AKEBIA THERAPEUTICS, INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2019	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	\$ 147,449	\$ 104,644
Available for sale securities	245	216,996
Inventory	116,349	114,245
Accounts receivable, net	38,864	16,666
Prepaid expenses and other current assets	6,626	15,724
Total current assets	309,533	468,275
Property and equipment, net	10,380	8,023
Operating lease assets	29,038	—
Goodwill	55,053	55,053
Other intangible assets, net	291,212	328,153
Other assets	75,985	137,036
Total assets	\$ 771,201	\$ 996,540
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	\$ 39,217	\$ 42,796
Accrued expenses	129,071	150,917
Current portion of long-term debt	—	15,000
Short-term deferred revenue	39,830	56,980
Total current liabilities	208,118	265,693
Deferred rent, net of current portion	—	3,006
Deferred revenue, net of current portion	33,120	55,709
Operating lease liabilities, net of current portion	27,528	—
Deferred tax liabilities	—	6,631
Derivative liability	1,650	—
Long-term debt, net	75,805	—
Other non-current liabilities	30,223	29,573
Total liabilities	376,444	360,612
Commitments and contingencies (Note 16)		
Stockholders' equity:		
Preferred stock \$0.00001 par value, 25,000,000 shares authorized at December 31, 2019 and 2018; 0 shares issued and outstanding at December 31, 2019 and 2018	—	—
Common stock: \$0.00001 par value; 175,000,000 shares authorized at December 31, 2019 and 2018; 121,674,568 and 116,887,518 shares issued and outstanding at December 31, 2019 and 2018, respectively	1	1
Additional paid-in capital	1,188,810	1,150,583
Accumulated other comprehensive loss	—	(261)
Accumulated deficit	(794,054)	(514,395)
Total stockholders' equity	394,757	635,928
Total liabilities and stockholders' equity	\$ 771,201	\$ 996,540

See accompanying notes to consolidated financial statements.

AKEBIA THERAPEUTICS, INC.

Consolidated Statements of Operations and Comprehensive Loss

(in thousands, except share and per share data)

	Year Ended December 31,		
	2019	2018	2017
Revenues:			
Product revenue, net	\$ 111,119	\$ 6,824	\$ —
License, collaboration and other revenue	223,882	200,918	181,227
Total revenues	<u>335,001</u>	<u>207,742</u>	<u>181,227</u>
Cost of goods sold:			
Product	108,935	6,251	—
Amortization of intangible assets	36,401	1,517	—
Total cost of goods sold	<u>145,336</u>	<u>7,768</u>	<u>—</u>
Operating expenses:			
Research and development	322,969	291,007	230,893
Selling, general and administrative	149,455	87,061	27,008
License expense	3,529	67	—
Total operating expenses	<u>475,953</u>	<u>378,135</u>	<u>257,901</u>
Operating loss	(286,288)	(178,161)	(76,674)
Other income (expense):			
Interest income, net	792	6,154	2,799
Other income (expense)	(794)	81	204
Net loss before income taxes	(286,290)	(171,926)	(73,671)
Benefit from income taxes	(6,631)	(28,338)	—
Net loss	<u>\$ (279,659)</u>	<u>\$ (143,588)</u>	<u>\$ (73,671)</u>
Net loss per share - basic and diluted	<u>\$ (2.36)</u>	<u>\$ (2.47)</u>	<u>\$ (1.69)</u>
Weighted-average number of common shares - basic and diluted	<u>118,395,919</u>	<u>58,038,252</u>	<u>43,500,795</u>
Comprehensive loss:			
Net loss	\$ (279,659)	\$ (143,588)	\$ (73,671)
Other comprehensive gain (loss) - unrealized gain (loss) on securities	261	181	(400)
Total comprehensive loss	<u>\$ (279,398)</u>	<u>\$ (143,407)</u>	<u>\$ (74,071)</u>

See accompanying notes to consolidated financial statements.

Akebia Therapeutics, Inc.

Consolidated Statements of Stockholders' Equity

(in thousands, except share and per share data)

	Common Stock		Additional Paid-In Capital	Unrealized Gain/Loss	Accumulated Deficit	Total Stockholders' Equity
	Number of Shares	\$0.00001 Par Value				
Balance at December 31, 2016	38,615,709	\$ —	\$ 365,298	\$ (42)	\$ (297,136)	\$ 68,120
Issuance of common stock, net of issuance costs	8,672,270	—	114,580	—	—	114,580
Proceeds from sale of stock under employee stock purchase plan	44,833	—	353	—	—	353
Forfeitures of restricted common stock	(2,406)	—	—	—	—	—
Exercise of options	256,213	—	1,312	—	—	1,312
Share-based compensation expense	—	—	8,867	—	—	8,867
Restricted stock unit vesting	26,000	—	—	—	—	—
Issuance of common stock warrants	—	—	3,413	—	—	3,413
Unrealized loss	—	—	—	(400)	—	(400)
Net loss	—	—	—	—	(73,671)	(73,671)
Balance at December 31, 2017	47,612,619	\$ —	\$ 493,823	\$ (442)	\$ (370,807)	\$ 122,574
Keryx Merger	57,773,090	1	527,753	—	—	527,754
Issuance of Baupost Additional Share	1,497,320	—	13,386	—	—	13,386
Issuance of common stock excluding Keryx Merger, net of issuance costs	9,194,306	—	95,452	—	—	95,452
Proceeds from sale of stock under employee stock purchase plan	48,768	—	482	—	—	482
Exercise of options	178,382	—	647	—	—	647
Share-based compensation expense	—	—	19,040	—	—	19,040
Restricted stock unit vesting	583,033	—	—	—	—	—
Unrealized gain	—	—	—	181	—	181
Net loss	—	—	—	—	(143,588)	(143,588)
Balance at December 31, 2018	116,887,518	\$ 1	\$ 1,150,583	\$ (261)	\$ (514,395)	\$ 635,928
Issuance of common stock, net of issuance costs	4,068,912	—	25,785	—	—	25,785
Proceeds from sale of stock under employee stock purchase plan	87,530	—	383	—	—	383
Exercise of options	362,796	—	560	—	—	560
Retired shares	(55,324)	—	(426)	—	—	(426)
Share-based compensation expense	—	—	11,925	—	—	11,925
Restricted stock unit vesting	323,136	—	—	—	—	—
Unrealized gain	—	—	—	261	—	261
Net loss	—	—	—	—	(279,659)	(279,659)
Balance at December 31, 2019	121,674,568	\$ 1	\$ 1,188,810	\$ —	\$ (794,054)	\$ 394,757

See accompanying notes to consolidated financial statements.

AKEBIA THERAPEUTICS, INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year ended December 31,		
	2019	2018	2017
Operating activities:			
Net loss	\$ (279,659)	\$ (143,588)	\$ (73,671)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	2,245	899	617
Amortization of intangible assets	36,401	1,522	—
Amortization of premium/discount on investments	(819)	(1,232)	610
Non-cash interest expense	786	28	—
Non-cash operating lease expense	(2,229)	—	—
Write-off of property and equipment	2,053	—	—
Non-cash merger expense ⁽¹⁾	—	13,386	—
Fair value write-up of inventory sold	70,444	4,771	—
Write-down of inventory	7,112	—	—
Stock-based compensation	11,925	19,040	8,867
Deferred income taxes	(6,631)	(28,338)	—
Fair value of warrants issued for license	—	—	3,413
Changes in operating assets and liabilities:			
Accounts receivable	(22,198)	33,384	(393)
Inventory	(29,142)	26	—
Prepaid expenses and other current assets	10,541	(977)	(4,193)
Other long-term assets	4,917	903	(991)
Accounts payable	1,372	13,717	4,959
Accrued expense	(27,351)	55,482	21,974
Operating lease liabilities	2,531	—	—
Deferred revenue	(39,739)	(66,935)	(17,665)
Deferred rent	—	418	314
Net cash used in operating activities	<u>(257,441)</u>	<u>(97,494)</u>	<u>(56,159)</u>
Investing activities:			
Acquisition of business, net of acquired cash and restricted cash	—	6,147	—
Purchase of property and equipment	(6,655)	(1,606)	(1,622)
Proceeds from the maturities of available for sale securities	153,110	243,269	149,998
Proceeds from sales of available for sale securities	64,721	13,000	5,000
Purchase of available for sale securities	—	(224,216)	(330,636)
Net cash provided by (used in) investing activities	<u>211,176</u>	<u>36,594</u>	<u>(177,260)</u>
Financing activities:			
Proceeds from the issuance of common stock, net of issuance costs	25,785	95,452	114,580
Proceeds from the sale of stock under employee stock purchase plan	383	482	353
Proceeds from the exercise of stock options	560	647	1,312
Retirement of treasury stock	(426)	—	—
Proceeds from the issuance of debt, net	77,668	—	—
Payments on debt	(15,000)	—	—
Payments on capital lease obligations	—	(19)	(5)
Net cash provided by financing activities	<u>88,970</u>	<u>96,562</u>	<u>116,240</u>
Increase (decrease) in cash, cash equivalents, and restricted cash	42,705	35,662	(117,179)
Cash, cash equivalents, and restricted cash at beginning of the period	107,099	71,437	188,616
Cash, cash equivalents, and restricted cash at end of the period	<u>\$ 149,804</u>	<u>\$ 107,099</u>	<u>\$ 71,437</u>
Non-cash financing activities			
Fair value of shares and equity awards issued in acquisition	\$ —	\$ 527,754	\$ —

(1) Relates to non-cash expense associated with the fair value of the Baupost additional shares (see Note 5).

See accompanying notes to consolidated financial statements.

1. Nature of Organization and Operations

Akebia Therapeutics, Inc., referred to as Akebia or the Company, was incorporated in the State of Delaware in 2007. Akebia is a biopharmaceutical company focused on the development and commercialization of renal therapeutics for people living with kidney disease. Akebia's lead investigational product candidate, vadadustat, is an oral therapy in Phase 3 development. The Company believes vadadustat has the potential to set a new standard of care in the treatment of anemia due to CKD, acting via a novel hypoxia inducible factor, or HIF, pathway. HIF is the primary regulator of the production of red blood cells, or RBCs, in the body, as well as other important metabolic functions. The Company's commercial product, Auryxia is currently approved by the United States Food and Drug Administration, or FDA, and marketed for two indications in the United States, the control of serum phosphorus levels in adult patients with chronic kidney disease, or CKD, on dialysis, or DD-CKD, and the treatment of iron deficiency anemia, or IDA, in adult patients with CKD not on dialysis, or NDD-CKD. Ferric citrate is also approved and marketed in Japan as an oral treatment for the improvement of hyperphosphatemia in patients with DD-CKD and NDD-CKD under the trade name Riona.

On November 11, 2019, the Company, with Keryx Biopharmaceuticals, Inc., or Keryx, as guarantor, entered into a loan agreement, or the Loan Agreement, with Biopharma Credit plc as collateral agent and lender, or the Collateral Agent, and Biopharma Credit Investments V (Master) LP as lender, or collectively with the Collateral Agent, Pharmakon, pursuant to which term loans in an aggregate principal amount of \$100.0 million are available to the Company in two tranches, subject to certain terms and conditions, or the Term Loan. The first tranche of \$80.0 million, or Tranche A, was drawn on November 25, 2019. The second tranche under the Term Loan allows the Company to borrow an additional \$20.0 million until December 31, 2020, subject to the satisfaction of customary conditions. Refer to Note 11 to our consolidated financial statements in Part II, Item 8 – Financial Statements and Supplementary Data for additional details on the Loan Agreement.

On December 12, 2018, the Company completed a merger with Keryx Biopharmaceuticals, Inc., or Keryx, or the Merger. Pursuant to the terms and conditions of the Agreement and Plan of Merger, or the Merger Agreement, each share of Keryx common stock, or Keryx Share, issued and outstanding immediately prior to the effective time of the Merger, or the Effective Time, was cancelled and converted into 0.37433, or the Exchange Multiplier, fully paid and non-assessable shares of Akebia common stock, or Akebia Shares, resulting in the issuance of an aggregate of 59,270,410 Akebia Shares.

Since inception, the Company has devoted most of its resources to research and development, including its preclinical and clinical development activities, raising capital, and providing general and administrative support for these operations. The Company began recording revenue from the U.S. sales of Auryxia and revenue from sublicensing rights to Auryxia in Japan to the Company's Japanese partners Japan Tobacco, Inc. and its subsidiary Torii Pharmaceutical Co., Ltd., collectively JT and Torii, on December 12, 2018. The Company has not generated a profit to date and may never generate profits from product sales. The Company's product candidates are subject to long development cycles, and the Company may be unsuccessful in its efforts to develop, obtain marketing approval for or market its product candidates. If the Company does not successfully commercialize any of its products or product candidates, it may be unable to achieve profitability.

The Company is subject to a number of risks including, but not limited to, risks relating to integration following the Merger, the need to obtain adequate additional funding, including the resources necessary to fund the continued commercialization of Auryxia, the global Phase 3 program for vadadustat in NDD-CKD, called PRO₂TECT, and DD-CKD, called INNO₂VATE, and post-approval studies with respect to Auryxia, risks relating to market acceptance, coverage and reimbursement of Auryxia, risks related to maintaining the Company's commercial organization and capabilities, risks relating to potential generic entrants, risks of clinical trial failures, the risk of relying on third parties, the risk that the Company never achieves profitability, protection of proprietary technology, compliance with governmental regulations, and dependence on key personnel, and the impact of legal, regulatory and administrative proceedings. Overall, the PRO₂TECT and INNO₂VATE Phase 3 programs have enrolled 7,436 patients. In August 2016, the first patient was dosed in INNO₂VATE. The Company completed enrollment of INNO₂VATE in April 2019. The Company anticipates reporting top-line data for the INNO₂VATE studies in the second quarter of 2020. The first patient was dosed in PRO₂TECT in December 2015. The Company completed enrollment of PRO₂TECT in August 2019. The Company anticipates reporting top-line data for the PRO₂TECT studies in mid-2020.

In December 2015, the Company entered into a collaboration agreement with Mitsubishi Tanabe Pharma Corporation, or MTPC, to develop and commercialize vadadustat in Japan and certain other countries in Asia, collectively, the MTPC Territory, for total payments of up to \$245.0 million, comprised of a \$20.0 million upfront payment, up to \$50.0 million in specified development and regulatory milestones, and up to \$175.0 million in specified commercial milestones, as well as tiered double-digit royalty payments up to 20% on sales of vadadustat in the MTPC Territory, subject to a reduction upon launch of a generic product on a country-by-country basis (Note 4).

In December 2016, the Company entered into a collaboration and license agreement with Otsuka Pharmaceutical Co. Ltd., or Otsuka, to develop and commercialize vadadustat in the United States. In December 2016, the Company received \$125.0 million upfront payment, and in March 2017, Otsuka reimbursed the Company approximately \$33.8 million for global expenses previously incurred by us for its ongoing global development program for vadadustat in DD-CKD and NDD-CKD patients. The agreement also provides for additional funding for the global development program for vadadustat, totaling \$266.8 million or more, depending on the actual global development costs incurred. In addition, Akebia is eligible to receive from Otsuka up to \$190.0 million in specified development and regulatory milestones and up to \$575.0 million in specified commercial milestones. The Company will share with Otsuka the costs of developing and commercializing vadadustat in the United States and the profits from sales of vadadustat in the United States after approval by the FDA and commercial launch (Note 4).

In April 2017, the Company entered into a collaboration and license agreement with Otsuka to develop and commercialize vadadustat in Europe, Russia, China, Canada, Australia, the Middle East and certain other territories. In April 2017, the Company received a \$73.0 million upfront payment and \$0.2 million for global expenses previously incurred by the Company in implementing the current global Phase 3 development plan for vadadustat in DD-CKD and NDD-CKD patients in excess of a specified threshold during the quarter-ended March 31, 2017. The agreement also provides for additional funding for the global development program for vadadustat, totaling \$214.0 million or more, depending on the actual global development costs incurred. In addition, Akebia is eligible to receive from Otsuka up to \$132.0 million in specified development and regulatory milestones and up to \$525.0 million in specified commercial milestones (Note 4).

From inception through December 31, 2019, the Company has raised approximately \$494.6 million of net proceeds from the sale of equity, including \$377.4 million from several underwritten public offerings, \$67.2 million from at-the-market offerings, or ATM offerings, pursuant to sales agreements with Cantor Fitzgerald & Co. and \$50.0 million from the sale of 3,571,429 shares of common stock to Vifor (International) Ltd., or Vifor Pharma. In November 2019, the Company also received net proceeds of \$77.3 million from Tranche A of the Loan Agreement with Pharmakon. Subsequent to December 31, 2019 and through February 4, 2020, the Company raised \$56.7 million from ATM offerings. At inception of the Company's collaboration agreements with Otsuka and MTPC, they committed to an aggregate of approximately \$573.0 million or more in cost-share funding, of which the Company received approximately \$272.0 million at the onset of the collaborations, and the remainder of which the Company generally continues to receive on a quarterly prepaid basis, and via license payments.

Management of the Company completed its going concern assessment in accordance with ASC 205-40. The Company believes that its cash resources will be sufficient to allow the Company to fund its current operating plan through at least the next twelve months from the filing of the Company's 2019 Annual Report on Form 10-K, as required by ASC 205-40. There can be no assurance, however, that the current operating plan will be achieved in the time frame anticipated by the Company, or that its cash resources will fund the Company's operating plan for the period anticipated by the Company or that additional funding will be available on terms acceptable to the Company, or at all. The Company will require additional capital for the further commercialization of Auryxia and continued development and potential commercialization of the Company's existing product candidates and would need to raise additional funds to pursue development activities related to any additional product candidates. If and until the Company can generate a sufficient amount of product revenue, the Company expects to finance future cash needs through public or private equity or debt transactions, payments from its collaborators, royalty transactions, strategic transactions, or a combination of these approaches. However, adequate additional financing may not be available to the Company on acceptable terms, or at all. If the Company is unable to raise capital when needed or on attractive terms, it may be forced to delay, reduce or eliminate its research and development programs or any commercialization efforts.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation. These consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP). Any reference in these notes to applicable guidance is meant to refer to the authoritative U.S. GAAP as found in the Accounting Standards Codification (ASC) and Accounting Standards Update (ASU) of the Financial Accounting Standards Board (FASB).

New Accounting Pronouncements – Recently Adopted

In February 2016, the FASB issued ASU 2016-02, *Leases* (Topic 842), which supersedes the existing guidance for lease accounting, *Leases* (Topic 840). ASU 2016-02 requires entities to recognize right-of-use assets and lease liabilities for leases with lease terms of more than 12 months on their balance sheets and provide enhanced disclosures. In 2018, the FASB issued additional ASUs related to Topic 842, or ASC 842, that clarified various aspects of the new lease guidance, including how to record certain transition adjustments, as well as other improvements and practical expedients. The Company adopted this new standard on January 1, 2019 using the modified retrospective approach for all leases existing at, or entered into after, the date of initial application, and has elected to use the following practical expedients that are permitted under the rules of the adoption:

- The Company elected the package of transition practical expedients, which allows it to retain the lease classification and initial direct costs for any leases that existed prior to the adoption of this new standard.
- The Company will not reassess whether any contracts completed prior to the adoption are leases.

The Company adopted ASC 842 using the modified retrospective approach, as of January 1, 2019, with no restatements of prior periods or a cumulative effect of the adoption of ASC 842 in retained earnings. On January 1, 2019, the Company recognized additional operating lease liabilities, net of deferred rent, of approximately \$37.1 million based on the present value of the remaining minimum lease payments, a corresponding right of use assets of approximately \$33.4 million, and \$0.9 million to prepaid expenses and other current assets related to leasehold improvement allowances that had yet to be incurred as of the date of adoption, but for which the Company was reasonably certain to incur costs at least equal to the maximum level of leasehold improvement allowance. The adoption of ASC 842 did not have an impact on the Company's consolidated statement of operations. Prior periods are presented in accordance with ASC 840, *Leases*.

The Company made an accounting policy election not to recognize leases with an initial term of 12 months or less within its consolidated balance sheets and to recognize those lease payments on a straight-line basis in its consolidated statements of operations. The Company also made the accounting policy election not to separate the non-lease components from the lease components for its building leases and, rather, account for each non-lease component and lease component as a single component.

The Company determines if an arrangement is a lease at inception. An arrangement is determined to contain a lease if the contract conveys the right to control the use of an identified property, plant, or equipment for a period of time in exchange for consideration. If the Company can benefit from the various underlying assets of a lease on their own or together with other resources that are readily available, or if the various underlying assets are neither highly dependent on nor highly interrelated with other underlying assets in the arrangement, they are considered to be a separate lease component. In the event multiple underlying assets are identified, the lease consideration is allocated to the various components based on each of the component's relative fair value.

Operating lease assets represent the Company's right to use an underlying asset for the lease term and operating lease liabilities represent its obligation to make lease payments arising from the leasing arrangement. Operating lease assets and operating lease liabilities are recognized at the commencement date based on the present value of lease payments over the lease term. The Company uses the implicit rate when readily determinable and uses an estimate of its incremental borrowing rate when the implicit rate is not readily determinable based upon the available information at the commencement date of lease inception. The incremental borrowing rate is determined using a credit rating scoring model to estimate the Company's credit rating, adjusted for collateralization. The calculation of the operating lease assets includes any lease payments made and excludes any lease incentives. The Company's lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option.

The Company's operating leases are reflected in prepaid expenses and other current assets, operating lease assets, accrued expenses and operating lease liabilities, net of current portion in its consolidated balance sheets. Lease expense for minimum lease payments is recognized on a straight-line basis over the lease term.

In January 2017, the FASB issued ASU 2017-04, *Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment*, which simplifies how companies calculate goodwill impairments by eliminating Step 2 of the impairment test. Step 2 measures a goodwill impairment loss by comparing the implied fair value of a reporting unit's goodwill with the carrying amount of that goodwill. ASU 2017-04 requires companies to compare the fair value of a reporting unit to its carrying amount and recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value; however, the loss recognized should not exceed the total amount of goodwill allocated to the related reporting unit. This ASU is effective for annual periods beginning after December 15, 2019, and is applicable to the Company in fiscal year 2020. Early adoption is allowed, and the Company adopted ASU 2017-04 in the first quarter of fiscal year 2019. The Company conducted its initial goodwill impairment test as of October 1, 2019 and will continue to do so annually hereafter, or more frequently if indicators of impairment are present or changes in circumstances suggest that an impairment may exist.

New Accounting Pronouncements – Not Yet Adopted

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, which requires that financial assets measured at amortized cost be presented at the net amount expected to be collected. Currently, U.S. GAAP delays recognition of the full amount of credit losses until the loss is probable of occurring. Under this ASU, the income statement will reflect an entity's current estimate of all expected credit losses. The measurement of expected credit losses will be based upon historical experience, current conditions, and reasonable and supportable forecasts that affect the collectability of the reported amount. Credit losses relating to available-for-sale debt securities will be recorded through an allowance for credit losses rather than as a direct write-down of the security. Additionally, credit losses for trade receivables will be also be recorded through an allowance that reflects the Company's current estimate of credit losses expected to be incurred. This ASU is effective for annual periods beginning after December 15, 2019, and is applicable to the Company in fiscal year 2020. Early adoption is permitted. The Company is currently evaluating the impact of the adoption of ASU 2016-13 on its consolidated financial position and results of operations. Based on the composition of the Company's available-for-sale debt securities, trade receivables, and other financial assets, and also taking into account current market conditions and historical credit loss activity, the Company does not expect that the adoption of this standard will have a material impact on the Company's consolidated financial statements and related disclosures.

In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement*, which modifies the disclosure requirements for fair value measurements. This ASU is effective for annual periods beginning after December 15, 2019, and is applicable to the Company in fiscal year 2020. Early adoption is permitted. The Company is currently evaluating the impact the adoption of the standard will have on its consolidated financial statements and related disclosures.

In December 2019, the FASB issued ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*. This ASU is effective for fiscal years beginning after December 15, 2020, including interim periods therein, and is applicable to the Company in fiscal year 2021. Early adoption is permitted. The Company does not expect that the adoption of this standard will have a material impact on the Company's consolidated financial statements and related disclosures.

Segment Information

Operating segments are defined as components of an enterprise about which separate discrete information is available for evaluation by the chief operating decision maker, or decision-making group, in deciding how to allocate resources and in assessing performance. The Company views its operations and manages its business in one operating segment, which is the business of developing and commercializing novel therapeutics for people with kidney disease.

Derivative Financial Instruments

The Company accounts for warrants and other derivative financial instruments as either equity or liabilities in accordance with ASC Topic 815, *Derivatives and Hedging*, or ASC 815, based upon the characteristics and provisions of each instrument. Warrants classified as equity are recorded at fair value as of the date of issuance on the Company's consolidated balance sheets and no further adjustments to their valuation are made. Warrants classified as derivative liabilities and other derivative financial instruments that require separate accounting as liabilities are recorded on the Company's consolidated balance sheets at their fair value on the date of issuance and will be revalued on each subsequent balance sheet date until such instruments are exercised or expire, with any changes in the fair value between reporting periods recorded as other income or expense. The warrant issued by the Company in connection with the Janssen Pharmaceutica NV Research and License Agreement, the Janssen Agreement, is classified as equity in the Company's consolidated balance sheet. (See Note 12). The derivative liability recorded in connection with the Company's Loan Agreement with Pharmakon is classified as a liability in the Company's consolidated balance sheet. (See Note 11).

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results may differ from those estimates. Management considers many factors in selecting appropriate financial accounting policies and controls, and in developing the estimates and assumptions that are used in the preparation of these financial statements. Management must apply significant judgment in this process. In addition, other factors may affect estimates, including expected business and operational changes, sensitivity and volatility associated with the assumptions used in developing estimates, and whether historical trends are expected to be representative of future trends. The estimation process often may yield a range of potentially reasonable estimates of the ultimate future outcomes, and management must select an amount that falls within that range of reasonable estimates. Estimates are used in the following areas, among others: prepaid and accrued research and development expense, operating lease assets and liabilities, derivative liabilities, other non-current liabilities, stock-based compensation expense, product and collaboration revenues including various rebates and reserves related to product sales, inventories, income taxes, intangible assets and goodwill.

Cash, Cash Equivalents, and Restricted Cash

Cash and cash equivalents consist of all cash on hand, deposits and funds invested in available for sale securities with original maturities of three months or less at the time of purchase. Cash equivalents are reported at fair value. At December 31, 2019, the Company's cash is primarily in money market funds. The Company may maintain balances with its banks in excess of federally insured limits.

Restricted cash represents amounts required for security deposits under the Company's office and lab space lease agreements and, at December 31, 2018, cash balances held as collateral for the Company's employee credit card program. Restricted cash is included in "prepaid expenses and other current assets" and "other assets" in the consolidated balance sheets.

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported in the consolidated balance sheet that sum to the total of the amounts reported in the consolidated statement of cash flows (in thousands):

	<u>December 31, 2019</u>	<u>December 31, 2018</u>	<u>December 31, 2017</u>	<u>December 31, 2016</u>
Cash and cash equivalents	\$ 147,449	\$ 104,644	\$ 70,156	\$ 187,335
Prepaid expenses and other current assets	263	—	—	—
Other assets	2,092	2,455	1,281	1,281
Total cash, cash equivalents, and restricted cash shown in the statement of cash flows	<u>\$ 149,804</u>	<u>\$ 107,099</u>	<u>\$ 71,437</u>	<u>\$ 188,616</u>

Investments

Management determines the appropriate classification of securities at the time of purchase and reevaluates such designation as of each balance sheet date. Currently, the Company classifies all securities as available for sale which are included in current assets as they are intended to fund current operations. The Company carries available for sale securities at fair value. The Company conducts periodic reviews to identify and evaluate each investment that has an unrealized loss, in accordance with the meaning of other-than-temporary impairment and its application to certain investments. When assessing whether a decline in the fair value of a security is other-than-temporary, the Company considers the fair market value of the security, the duration of the security's decline, and prospects for the underlying business. Based on these considerations, the Company did not identify any other-than-temporary unrealized losses at December 31, 2019. Unrealized losses on available for sale securities that are determined to be temporary, and not related to credit loss, are recorded in accumulated other comprehensive loss, a component of stockholders' equity. The amortized cost of debt securities in this category reflects amortization of premiums and accretion of discounts to maturity computed under the effective interest method. The Company includes this amortization in the caption "Interest income, net" within the consolidated statements of operations and comprehensive loss. The Company also includes in net investment income, realized gains and losses and declines in value determined to be other than temporary. The Company bases the cost of securities sold upon the specific identification method and includes interest and dividends on securities in interest income.

Accounts Receivable

The Company's accounts receivable represent amounts due to the Company from product sales (see Note 3) and from its collaboration agreements with MTPC and Otsuka (see Note 4). Reimbursable costs that have not been invoiced as of the balance sheet date are recorded as unbilled accounts receivable. Accounts receivable arising from product sales primarily represent amounts due from wholesale distributors as well as certain specialty pharmacy providers, or collectively, Customers. The Company deducts trade allowances for prompt payment, among other discounts, from its accounts receivable based on its experience that the Company's Customers will earn these discounts and fees.

The Company makes judgments as to its ability to collect outstanding receivables and provides an allowance for receivables when collection becomes doubtful. Provisions are made based upon a specific review of all significant outstanding invoices and the overall quality and age of those invoices not specifically reviewed as well as historical payment patterns and existing economic factors. The Company believes that credit risks associated with its Customers and collaboration partners are not significant. The Company did not have an allowance for doubtful accounts as of December 31, 2019 and 2018.

Concentrations of Credit Risk and Off-Balance Sheet Risk

Cash, cash equivalents, investments, and accounts receivable are the only financial instruments that potentially subject the Company to concentrations of credit risk. The Company maintains its cash, cash equivalents, and investments with high quality, accredited financial institutions and, accordingly, such funds are subject to minimal credit risk. The Company's investment policy includes guidelines on the quality of the institutions and financial instruments and defines allowable investments that the Company believes minimizes the exposure to concentration of credit risk. The Company has no significant off-balance sheet concentrations of credit risk, such as foreign currency exchange contracts, option contracts or other hedging arrangements.

Accounts receivable represent amounts due from the Company's Customers and collaboration partners. As part of its credit management policy, the Company performs ongoing credit evaluations of its Customers and generally does not require collateral from any customer. The Company also monitors economic conditions of its collaboration partners to identify facts or circumstances that may indicate that any of its accounts receivable are at risk of collection.

Gross revenues and accounts receivable from each of the Company's Customers or collaboration partners who individually accounted for 10% or more of total gross revenues and/or 10% or more of total gross accounts receivable consisted of the following:

	Percent of Total Gross Revenues		
	Years Ended December 31,		
	2019	2018	2017
Otsuka Pharmaceutical Co. Ltd.	45%	90%	76%
Fresenius Medical Care Rx	21%	—	—
AmerisourceBergen Drug Corporation	10%	—	—

	Percent of Gross Accounts Receivable	
	As of December 31,	
	2019	2018
Otsuka Pharmaceutical Co. Ltd. ⁽¹⁾	35%	—
AmerisourceBergen Drug Corporation	16%	11%
Cardinal Health, Inc.	15%	13%
Fresenius Medical Care Rx ⁽²⁾	15%	42%
McKesson Corporation	11%	22%

- (1) Accounts receivable from Otsuka Pharmaceutical Co. Ltd. did not represent greater than 10% of gross accounts receivable at December 31, 2018 due to timing of payments and costs incurred. As such, the Company did not have an accounts receivable balance for Otsuka as of December 31, 2018.
- (2) The change in accounts receivable for Fresenius Medical Care Rx as of December 31, 2018 to December 31, 2019 was due to timing of payments received. Fresenius was the Company's largest commercial customer in 2019 by total gross revenue, as seen in the Percent of Total Gross Revenues table above.

Property and Equipment

Property and equipment is stated at cost, less accumulated depreciation. Assets under capital lease are included in property and equipment. Property and equipment is depreciated using the straight-line method over the estimated useful lives of the assets, generally three to seven years. Such costs are periodically reviewed for recoverability when impairment indicators are present. Such indicators include, among other factors, operating losses, unused capacity, market value declines and technological obsolescence. Recorded values of asset groups of equipment that are not expected to be recovered through undiscounted future net cash flows are written down to current fair value, which generally is determined from estimated discounted future net cash flows (assets held for use) or net realizable value (assets held for sale).

The following is the summary of property and equipment and related accumulated depreciation as of December 31, 2019 and 2018.

	Useful Life	December 31, 2019		December 31, 2018	
		(in thousands)			
Computer equipment and software	3	\$	1,010	\$	1,593
Furniture and fixtures	5-7		2,086		1,170
Equipment	7		2,451		1,780
	Shorter of the useful life or remaining lease term				
Leasehold improvements	(10 years)		8,497		5,324
Office equipment under capital lease	3		—		114
			14,044		9,981
Less accumulated depreciation			(3,664)		(1,958)
Net property and equipment		\$	10,380	\$	8,023

Depreciation expense was approximately \$2.2 million, \$0.9 million and \$0.6 million for the years ended December 31, 2019, 2018 and 2017, respectively. For the year ended December 31, 2019, approximately \$2.1 million of certain leasehold improvements were written off in connection with the sublease of the Boston office.

Inventory

The Company values its inventories at the lower-of-cost or net realizable value. The Company determines the cost of its inventories, which includes amounts related to materials and manufacturing overhead, on a first-in, first-out basis. The Company classifies its inventory costs as long-term, in other assets in its consolidated balance sheets, when it expects to utilize the inventory beyond their normal operating cycle.

Prior to the regulatory approval of its product candidates, the Company incurs expenses for the manufacture of material that could potentially be available to support the commercial launch of its products. Until the first reporting period when regulatory approval has been received or is otherwise considered probable and the future economic benefit is expected to be realized, the Company records all such costs as research and development expense. Inventory used in clinical trials is also expensed as research and development expense, when selected for such use. Inventory that can be used in either the production of clinical or commercial products is expensed as research and development costs when identified for use in a clinical manufacturing campaign.

The Company performs an assessment of the recoverability of capitalized inventory during each reporting period, and writes down any excess and obsolete inventory to its net realizable value in the period in which the impairment is first identified. Such impairment charges, should they occur, are recorded as a component of cost of product sales in the consolidated statements of operations and comprehensive loss. The determination of whether inventory costs will be realizable requires the use of estimates by management. If actual market conditions are less favorable than projected by management, additional write-downs of inventory may be required. Additionally, the Company's product is subject to strict quality control and monitoring that it performs throughout the manufacturing process. In the event that certain batches or units of product no longer meet quality specifications, the Company will record a charge to cost of product sales to write-down any unmarketable inventory to its estimated net realizable value. In all cases, product inventory is carried at the lower of cost or its estimated net realizable value.

Debt

The Company performs an assessment of all embedded features of a debt instrument to determine if (1) such features should be bifurcated and separately accounted for, and (2) if bifurcation requirements are met, whether such features should be classified and accounted for as equity or liability instruments. If the embedded feature meets the requirements to be bifurcated and accounted for as a liability, the fair value of the embedded feature is measured initially, included as a liability on the consolidated balance sheet, and re-measured to fair value at each reporting period. Any changes in fair value are recorded in the consolidated statement of operations. The Company monitors, on an ongoing basis, whether events or circumstances could give rise to a change in the classification of embedded features.

Revenue Recognition

The Company generates revenues primarily from sales of Auryxia, see Note 3, and from its collaborations with MTPC and Otsuka, see Note 4. The Company recognizes revenue in accordance with ASC 606, which applies to all contracts with customers, except for contracts that are within the scope of other standards. Under ASC 606, the Company recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements that the Company determines are within the scope of ASC 606, it performs the following five steps:

- (i) identify the contract(s) with a customer;
- (ii) identify the performance obligations in the contract;
- (iii) determine the transaction price;
- (iv) allocate the transaction price to the performance obligations in the contract; and
- (v) recognize revenue when (or as) the entity satisfies a performance obligation.

The Company only applies the five-step model to contracts when it is probable that the entity will collect the consideration it is entitled to in exchange for the goods or services it transfers to the customer. At contract inception, once the contract is determined to be within the scope of ASC 606, the Company assesses the goods or services promised within each contract and determines those that are performance obligations, and assesses whether each promised good or service is distinct. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

The Company does not include a financing component to its estimated transaction price at contract inception unless it estimates that certain performance obligations will not be satisfied within one year. Additionally, the Company recognizes the incremental costs of obtaining a contract as an expense when incurred if the amortization period of the asset that the Company otherwise would have recognized is one year or less.

Product Revenue, Net

The Company sells Auryxia in the United States, or U.S., primarily to wholesale distributors as well as certain specialty pharmacy providers, collectively, Customers. These Customers resell the Company's product to health care providers and patients. In addition to distribution agreements with Customers, the Company enters into arrangements with health care providers and payors that provide for government-mandated and/or privately-negotiated rebates, chargebacks, and discounts with respect to the purchase of the Company's product.

The Company recognizes revenue on product sales when the Customer obtains control of the Company's product, which occurs at a point in time, typically upon delivery to the Customer. The Company expenses incremental costs of obtaining a contract as and when incurred if the expected amortization period of the asset that it would have recognized is one year or less.

Reserves for Variable Consideration

Revenue from product sales is recorded at the net sales price (transaction price), which includes estimates of variable consideration for which reserves are established and which result from discounts, returns, chargebacks, rebates, co-pay assistance and other allowances that are offered within contracts between the Company and its Customers, health care providers, payors and other indirect customers relating to the Company's sales of its products. These reserves are based on the amounts earned or to be claimed on the related sales and are classified as reductions of accounts receivable (if the amount will be credited to the Customer) or as a current liability (if the amount is payable to a Customer or a party other than a Customer). When appropriate, these estimates take into consideration a range of possible outcomes which are probability-weighted in accordance with the expected value method in ASC 606 for relevant factors such as the Company's historical experience, current contractual and statutory requirements, specific known market events and trends, industry data, and forecasted customer buying and payment patterns. Overall, these reserves reflect the Company's best estimates of the amount of consideration to which it is entitled based on the terms of the respective underlying contracts.

The amount of variable consideration that is included in the transaction price may be constrained, and is included in the net sales price only to the extent that it is probable that a significant reversal in the amount of the cumulative revenue recognized will not occur in a future period. Actual amounts of consideration ultimately received may differ from the Company's estimates. If actual results in the future vary from the Company's estimates, the Company will adjust these estimates, which would affect net product revenue and earnings in the period such variances become known.

Trade Discounts and Allowances: The Company generally provides Customers with discounts that include incentive fees that are explicitly stated in the Company's contracts and are recorded as a reduction of revenue in the period the related product revenue is recognized. In addition, the Company compensates (through trade discounts and allowances) its Customers for sales order management, data, and distribution services. However, the Company has determined such services received to date are not distinct from the Company's sale of products to the Customer and, therefore, these payments have been recorded as a reduction of revenue within the statement of operations and comprehensive loss through December 31, 2019. The Company records a corresponding reduction of accounts receivable (if the trade discount and/or allowance will be credited to the Customer) or an increase in accrued expense (if the trade discount and/or allowance is payable to a Customer) on the consolidated balance sheets.

Product Returns: Consistent with industry practice, the Company generally offers Customers a limited right of return which allows for the product to be returned when the product expiry is within an allowable window. This right of return lapses once the product is provided to a patient. The Company estimates the amount of its product sales that may be returned by its Customers and records this estimate as a reduction of revenue in the period the related product revenue is recognized. The Company currently estimates product return reserve using available industry data and its own historical sales information, including its visibility into the inventory remaining in the distribution channel.

Provider Chargebacks and Discounts: Chargebacks for fees and discounts to providers represent the estimated obligations resulting from contractual commitments to sell products to qualified healthcare providers at prices lower than the list prices charged to Customers who directly purchase the product from the Company. Customers charge the Company for the difference between what they pay for the product and the ultimate selling price to the qualified healthcare providers. These reserves are established in the same period that the related revenue is recognized, resulting in a reduction of product revenue and accounts receivable. Chargeback amounts are generally determined at the time of resale to the qualified healthcare provider by Customers, and the Company generally issues credits for such amounts within a few weeks of the Customer's resale of the product. Reserves for chargebacks consist of credits that

the Company expects to issue for units that remain in the distribution channel at each reporting period end that the Company expects will be sold to qualified healthcare providers, and chargebacks that Customers have claimed but for which the Company has not yet issued a credit.

Commercial and Medicare Part D Rebates: The Company contracts with various commercial payor organizations, primarily health insurance companies and pharmacy benefit managers, for the payment of rebates with respect to utilization of its products. The Company estimates the rebates for commercial and Medicare Part D payors based upon (i) its contracts with the payors and (ii) information obtained from its Customers and other third parties regarding the payor mix for Auryxia. The Company estimates these rebates and records such estimates in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability.

Other Government Rebates: The Company is subject to discount obligations under state Medicaid programs and other government programs. The Company estimates its Medicaid and other government programs rebates based upon a range of possible outcomes that are probability-weighted for the estimated payor mix. These reserves are recorded in the same period the related revenue is recognized, resulting in a reduction of product revenue and the establishment of a current liability which is included in accrued expenses and other current liabilities on the consolidated balance sheets. For Medicare, the Company also estimates the number of patients in the prescription drug coverage gap for whom the Company will owe an additional liability under the Medicare Part D program. The Company's liability for these rebates consists of invoices received for claims from prior quarters that have not been paid or for which an invoice has not yet been received, estimates of claims for the current quarter, and estimated future claims that will be made for product that has been recognized as revenue, but which remains in the distribution channel at the end of each reporting period.

Other Incentives: Other incentives that the Company offers include voluntary patient assistance programs such as the Company's co-pay assistance program, which are intended to provide financial assistance to qualified commercially insured patients with prescription drug co-payments required by payors. The calculation of the accrual for co-pay assistance is based on actual claims processed during a given period, as well as historical utilization data to estimate the amount the Company expects to receive associated with product that has been recognized as revenue, but remains in the distribution channel at the end of each reporting period.

Collaboration Revenues

The Company enters into out-license and collaboration agreements which are within the scope of ASC 606, under which it licenses certain rights to its product candidates to third parties. The terms of these arrangements typically include payment to the Company of one or more of the following: non-refundable, up-front license fees; development, regulatory, and commercial milestone payments; payments for manufacturing supply services the Company provides through its contract manufacturers; and royalties on net sales of licensed products. Each of these payments may result in license, collaboration and other revenue, except for revenues from royalties on net sales of licensed products, which are classified as royalty revenues.

In determining the appropriate amount of revenue to be recognized as the Company fulfills its obligations under each of its agreements, the Company implements the five-step model noted above. As part of the accounting for these arrangements, the Company must develop assumptions that require judgment to determine whether the individual promises should be accounted for as separate performance obligations or as a combined performance obligation, and to determine the stand-alone selling price for each performance obligation identified in the contract. A deliverable represents a separate performance obligation if both of the following criteria are met: (i) the customer can benefit from the good or service either on its own or together with other resources that are readily available to the customer, and (ii) the entity's promise to transfer the good or service to the customer is separately identifiable from other promises in the contract. The Company uses key assumptions to determine the stand-alone selling price, which may include forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates, and probabilities of technical and regulatory success. With regard to the MTPC and Otsuka collaboration agreements, the Company recognizes revenue related to amounts allocated to the identified performance obligation on a proportional performance basis as the underlying services are performed.

Licenses of Intellectual Property

If the license to the Company's intellectual property is determined to be distinct from the other performance obligations identified in an out-license and collaboration arrangement, the Company recognizes revenue from non-refundable, up-front fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. For licenses that are bundled with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue from non-refundable, up-front fees. The Company evaluates the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

Milestone Payments

At the inception of each arrangement that includes development milestone payments, the Company evaluates whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price using the most likely amount method. The Company evaluates factors such as the scientific, clinical, regulatory, commercial, and other risks that must be overcome to assess the milestone as probable of being achieved. There is considerable judgment involved in determining whether a milestone is probable of being reached at each specific reporting period. Milestone payments that are not within the control of the Company or the customer, such as regulatory approvals, are not considered probable of being achieved until those approvals are received. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which the Company recognizes revenues as, or when, the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, the Company re-evaluates the probability of achievement of such development milestones and any related constraint, and if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect collaboration revenue in the period of adjustment.

Manufacturing Supply Services

Arrangements that include a promise for future supply of drug substance or drug product for either clinical development or commercial supply at the licensee's discretion are generally considered as options. The Company assesses if these options provide a material right to the licensee and if so, they are accounted for as separate performance obligations. If the Company is entitled to additional payments when the licensee exercises these options, any additional payments are recorded in license, collaboration and other revenues when the licensee obtains control of the goods, which is upon delivery.

Royalties

The Company will recognize sales-based royalties, including milestone payments based on the level of sales, at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). The Company receives royalty payments from JT and Torii, based on net sales of Riona in Japan.

Collaborative Arrangements

The Company records the elements of its collaboration agreements that represent joint operating activities in accordance with ASC Topic 808, *Collaborative Arrangements* (ASC 808). Accordingly, the elements of the collaboration agreements that represent activities in which both parties are active participants and to which both parties are exposed to the significant risks and rewards that are dependent on the commercial success of the activities are recorded as collaborative arrangements. The Company considers the guidance in ASC 606-10-15, *Revenue from Contracts with Customers – Scope and Scope Exceptions*, in determining the appropriate treatment for the transactions between the Company and its collaborative partner and the transactions between the Company and third parties. Generally, the classification of transactions under the collaborative arrangements is determined based on the nature and contractual terms of the arrangement along with the nature of the operations of the participants. Therefore, the Company recognizes its allocation of the shared costs incurred with respect to the jointly conducted medical affairs and commercialization and non-promotional activities under the U.S. collaboration with Otsuka as a component of the related expense in the period incurred. During the years ended December 31, 2019 and 2018, the Company incurred approximately \$1.8 million and \$1.2 million, respectively, of costs related to the cost-sharing provisions of the Otsuka U.S. Agreement, as defined below in Note 4, of which approximately \$0.7 million and \$0.5 million are reimbursable by Otsuka and recorded as a reduction to research and development expense during the years ended December 31, 2019 and 2018, respectively. During the years ended December 31, 2019 and 2018, Otsuka incurred approximately \$1.9 million and \$1.1 million, respectively, of costs related to the cost-sharing provisions of the Otsuka U.S. Agreement, of which approximately \$1.0 million and \$0.5 million are reimbursable by the Company and recorded as an increase to research and development expense during the years ended December 31, 2019 and 2018, respectively. To the extent product revenue is generated from the collaboration, the Company recognizes its share of the net sales on a gross basis if it is deemed to be the principal in the transactions with customers, or on a net basis if it is instead deemed to be the agent in the transactions with customers, consistent with the guidance in ASC 606.

Business Combinations

The Company accounts for the acquisition of a business in accordance with ASC Topic 805, *Business Combinations*, or ASC 805. Amounts paid for each acquisition are allocated to the assets acquired and liabilities assumed based on their fair values at the date of acquisition. The Company determines the fair value of acquired intangible assets based on detailed valuations that use certain information and assumptions provided by management, which is considered management's best estimate of inputs and assumptions that a market participant would use. The Company allocates any excess purchase price over the fair value of the net tangible and intangible assets acquired to goodwill.

Under ASC 805, transaction costs are not included as a component of consideration transferred and are expensed as incurred. Additionally, in accordance with ASC 805, a transaction entered into by or on behalf of the acquirer or primarily for the benefit of the acquirer or the combined entity, rather than primarily for the benefit of the acquiree (before the combination), is treated as separate transaction.

Intangible Assets

The Company maintains a definite-lived intangible asset related to developed product rights for Auryxia, which was acquired on December 12, 2018 as part of the Merger.

Intangible assets are initially recorded at fair value and stated net of accumulated amortization and impairments. The Company amortizes its intangible assets that have finite lives using either the straight-line method, or if reliably determinable, based on the pattern in which the economic benefit of the asset is expected to be utilized. Amortization for the Company's intangible asset is recorded over its estimated useful life of nine years.

The Company reviews intangible assets subject to amortization to determine if any adverse conditions exist or a change in circumstances has occurred that would indicate impairment or a change in the remaining useful life. If an impairment indicator exists, the Company performs a recoverability test by comparing the sum of the estimated undiscounted cash flows of the intangible asset and asset group to its carrying value on the consolidated balance sheet. If the carrying value of the intangible asset exceeds the undiscounted cash flows used in the recoverability test, the Company will write the carrying value down to the fair value in the period identified. The Company calculates the fair value of intangible assets as the present value of estimated future cash flows expected to be generated from the intangible asset using a risk-adjusted discount rate. In determining estimated future cash flows associated with its intangible assets, the Company uses market participant assumptions pursuant to ASC Topic 820, *Fair Value Measurements and Disclosures* (ASC 820).

Goodwill

The Company allocates any excess purchase price over the fair value of the net tangible and intangible assets acquired in a business combination to goodwill. Goodwill is evaluated for impairment on an annual basis as of October 1, and more frequently if indicators are present or changes in circumstances suggest that impairment may exist.

The Company compares the fair value of its reporting unit to its carrying value. If the carrying value of the net assets assigned to the reporting unit exceeds the fair value of its reporting unit, the Company would record an impairment loss equal to the difference. As described above, the Company operates in one operating segment which the Company considers to be the only reporting unit.

Fair Value of Financial Instruments

The Company is required to disclose information on all assets and liabilities reported at fair value that enables an assessment of the inputs used in determining the reported fair values. ASC 820 establishes a hierarchy of inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that the observable inputs be used when available.

Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability, and are developed based on the best information available in the circumstances. The fair value hierarchy applies only to the valuation inputs used in determining the reported fair value of the investments, and is not a measure of the investment credit quality. The three levels of the fair value hierarchy are described below:

- Level 1 – Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access at the measurement date.
- Level 2 – Valuations based on quoted prices for similar assets or liabilities in markets that are not active, or for which all significant inputs are observable, either directly or indirectly.
- Level 3 – Valuations that require inputs that reflect the Company's own assumptions that are both significant to the fair value measurement and unobservable.

To the extent that valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is

greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Items measured at fair value on a recurring basis include available for sale securities and derivative liabilities (see Note 7). The carrying amounts of prepaid expenses and other current assets, accounts payable and accrued expenses approximate their fair values due to their short-term maturities.

Items measured at fair value on a nonrecurring basis include property and equipment, intangible assets and goodwill. The Company remeasures the fair value of these assets upon the occurrence of certain events. There were no remeasurements to property and equipment for the year ended December 31, 2019, other than the write-off of certain leasehold improvements in connection with the sublease of the Boston office. There were no impairments to assets measured using Level 3 inputs during the years ended December 31, 2019 or 2018, respectively.

The Company's other financial instruments mainly consists of debt (see Note 11). The carrying amount for the Company's Loan Agreement with Pharmakon approximates fair value because the interest rate is variable and reflects current market rates.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses are comprised of costs incurred in providing research and development activities, including salaries and benefits, facilities costs, overhead costs, contract research and development services, and other outside costs. Nonrefundable advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

External research and development expenses associated with the Company's programs include clinical trial site costs, research compounds and clinical manufacturing costs, costs incurred for consultants and other outside services, such as data management and statistical analysis support, and materials and supplies used in support of the clinical and preclinical programs. Internal costs of the Company's clinical program include salaries, benefits, stock-based compensation, and an allocation of the Company's facility costs. When third-party service providers' billing terms do not coincide with the Company's period-end, the Company is required to make estimates of its obligations to those third parties, including clinical trial and pharmaceutical development costs, contractual services costs and costs for supply of its drug candidates, incurred in a given accounting period and record accruals at the end of the period. The Company bases its estimates on its knowledge of the research and development programs, services performed for the period, past history for related activities and the expected duration of the third-party service contract, where applicable.

Advertising Expenses

The costs of advertising are expensed as incurred and included in selling, general and administrative expenses in the consolidated statements of operations and comprehensive loss. For the years ended December 31, 2019 and 2018, advertising expenses totaled \$6.0 million and \$0.5 million, respectively. Advertising expenses relate to advertising for Auryxia. The Company incurred advertising expenses throughout the entire fiscal year 2019 compared to the period from December 12, 2018 through December 31, 2018 in fiscal year 2018. The Company did not incur any advertising expenses for the year ended December 31, 2017.

Income Taxes

Income taxes are recorded in accordance with FASB Topic 740, *Income Taxes*, or ASC 740, which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are provided, if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. All deferred taxes as of December 31, 2019 and 2018 are classified as noncurrent within the income tax provision (see Note 14).

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position, as well as consideration of the available facts and circumstances. As of December 31, 2019 and 2018, the Company does not have any significant uncertain tax positions. The Company recognizes interest and penalties related to uncertain tax positions in income tax expense.

Stock-Based Compensation

The Company accounts for its stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation*, or ASC 718. ASC 718 requires all stock-based payments to employees and non-employees, including grants of stock options, restricted stock, restricted stock units, or RSUs, and modifications to existing stock awards, to be recognized in the statements of operations and comprehensive loss based on their fair values. The Company's stock-based awards are comprised of stock options and RSUs. The Company estimates the fair value of options granted using the Black-Scholes option pricing model. The Company uses a blend of its stock price and the quoted market price of comparable public companies to determine the fair value of restricted stock awards and common stock awards.

The Black-Scholes option pricing model requires the input of certain subjective assumptions, including (a) the expected stock price volatility, (b) the calculation of expected term of the award, (c) the risk-free interest rate and (d) expected dividends. Due to the lack of company-specific historical and implied volatility data for trading the Company's stock in the public market, the Company has based its estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. The historical volatility is calculated based on a period of time commensurate with the expected term assumption. The computation of expected volatility is based on the historical volatility of a representative group of companies with similar characteristics to the Company, including stage of product development and life science industry focus. During 2017, the Company began to estimate its volatility by using a blend of its stock price history for the length of time it has market data for its stock and the historical volatility of similar public companies for the expected term of each grant. The Company is a commercial-stage biopharmaceutical company and the representative group of companies has certain similar characteristics to the Company. The Company believes the group selected has sufficient similar economic and industry characteristics and includes companies that are most representative of the Company. The Company uses the simplified method as prescribed by the SEC Staff Accounting Bulletin No. 107, *Share-Based Payment*, to calculate the expected term for options granted to employees as it does not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term. The expected term is applied to the stock option grant group as a whole, as the Company does not expect substantially different exercise or post-vesting termination behavior among its employee population. For options granted to non-employees, the Company utilizes the contractual term of the arrangement as the basis for the expected term assumption. The risk-free interest rate is based on a treasury instrument whose term is consistent with the expected life of the stock options. The expected dividend yield is assumed to be zero as the Company has never paid dividends and has no current plans to pay any dividends on its common stock, which is similar to the Company's peer group.

The Company's stock-based awards are subject to either service- or performance-based vesting conditions. Compensation expense related to awards to employees and non-employees with service-based vesting conditions is recognized on a straight-line basis based on the grant date fair value over the associated service period of the award, which is generally the vesting term, and is adjusted for pre-vesting forfeitures in the period in which the forfeitures occur. Compensation expense related to awards to employees and non-employees with performance-based vesting conditions is recognized based on the grant date fair value over the requisite service period using the accelerated attribution method to the extent achievement of the performance condition is probable.

For awards with performance conditions in which the award does not vest unless the performance condition is met, the Company recognizes expense if, and to the extent that, the Company estimates that achievement of the performance condition is probable. If the Company concludes that vesting is probable, it recognizes expense from the date it reaches this conclusion through the estimated vesting date.

Net Loss per Share

Basic net loss per share is calculated by dividing net loss by the weighted-average shares outstanding during the period, without consideration for common stock equivalents. Diluted net loss per share is calculated by adjusting weighted-average shares outstanding for the dilutive effect of common stock equivalents outstanding for the period, determined using the treasury-stock method. For purposes of the diluted net loss per share calculation, preferred stock, stock options, warrants, restricted stock and RSUs are considered to be common stock equivalents, but have been excluded from the calculation of diluted net loss per share, as their effect would be anti-dilutive for all periods presented. Therefore, basic and diluted net loss per share were the same for all periods presented. Diluted net income per share is calculated by dividing the net income by the weighted-average common shares outstanding for the period, including any dilutive effect from outstanding options, warrants, restricted stock and RSUs using the treasury stock method.

3. Product Revenue, Net

To date, the Company's only source of product revenue has been from the U.S. sales of Auryxia, which it began recording on December 12, 2018 following the consummation of the Merger. Total net product revenue was \$111.1 million for the year ended December 31, 2019 and \$6.8 million for the period from December 12, 2018 to December 31, 2018. The following table summarizes activity in each of the product revenue allowance and reserve categories for the period from December 12, 2018 to December 31, 2018 and for the year ended December 31, 2019 (in thousands):

	Chargebacks and Discounts	Rebates, Fees and other Deductions	Returns	Total
Balance at December 12, 2018	\$ 466	\$ 21,247	\$ 418	\$ 22,131
Provisions related to sales	415	3,869	(58)	4,226
Credits/payments made relating to sales	(365)	(2,255)	—	(2,620)
Balance at December 31, 2018	<u>516</u>	<u>22,861</u>	<u>360</u>	<u>23,737</u>
Current provisions related to sales in current year	7,822	110,866	2,008	120,696
Adjustments related to prior year sales	—	1,149	—	1,149
Credits/payments made	(7,600)	(104,324)	(2,115)	(114,039)
Balance at December 31, 2019	<u>\$ 738</u>	<u>\$ 30,552</u>	<u>\$ 253</u>	<u>\$ 31,543</u>

Chargebacks, discounts and returns are recorded as a direct reduction of revenue on the consolidated statement of operations with a corresponding reduction to accounts receivable on the consolidated balance sheets. Rebates, distribution-related fees, and other sales-related deductions are recorded as a reduction in revenue on the consolidated statement of operations with a corresponding increase to accrued liabilities or accounts payable on the consolidated balance sheets.

Accounts receivable, net related to product sales was approximately \$23.0 million and \$15.1 million as of December 31, 2019 and 2018, respectively.

4. License, Collaboration and Other Significant Agreements

During the years ended December 31, 2019, 2018 and 2017, the Company recognized the following revenues from its license, collaboration and other significant agreements and had the following deferred revenue balances as of December 31, 2019:

	For the Year Ended December 31,		
	2019	2018	2017
License, Collaboration and Other Revenue:	(in thousands)		
MTPC Agreement	\$ 10,000	\$ 9,281	\$ 42,918
Otsuka U.S. Agreement	131,314	103,870	85,971
Otsuka International Agreement	75,614	87,320	52,307
Total Proportional Performance Revenue	\$ 216,928	\$ 200,471	\$ 181,196
JT and Torii	5,882	112	—
MTPC Other Revenue	1,072	335	31
Total License, Collaboration and Other Revenue	<u>\$ 223,882</u>	<u>\$ 200,918</u>	<u>\$ 181,227</u>
	December 31, 2019		
	Short-Term	Long-Term	Total
Deferred Revenue:	(in thousands)		
Otsuka U.S. Agreement	\$ 23,530	\$ 20,641	\$ 44,171
Otsuka International Agreement	16,300	7,800	24,100
Vifor Agreement	—	4,679	4,679
Total	<u>\$ 39,830</u>	<u>\$ 33,120</u>	<u>\$ 72,950</u>

The following table presents changes in the Company's contract assets and liabilities during the years ended December 31, 2019 and 2018 (in thousands):

	Balance at Beginning of Period	Additions	Deductions	Balance at End of Period
Twelve Months Ended December 31, 2019				
Contract assets:				
Other current assets	\$ —	\$ 10,000	\$ (10,000)	\$ —
Accounts receivable(1)	\$ 1,587	\$ 172,614	\$ (158,379)	\$ 15,822
Contract liabilities:				
Deferred revenue	\$ 112,689	\$ 167,189	\$ (206,928)	\$ 72,950
Accounts payable	\$ 13,492	\$ —	\$ (13,492)	\$ —
Twelve Months Ended December 31, 2018				
Contract assets:				
Other current assets	\$ —	\$ 531	\$ (531)	\$ —
Accounts receivable(1)	\$ 34,186	\$ 146,267	\$ (178,866)	\$ 1,587
Contract liabilities:				
Deferred revenue	\$ 179,624	\$ 133,537	\$ (200,472)	\$ 112,689
Accounts payable	\$ —	\$ 17,919	\$ (4,427)	\$ 13,492

- (1) Excludes accounts receivable from other services related to clinical and regulatory activities performed by the Company on behalf of MTPC that are not included in the performance obligations identified under the MTPC Agreement as of December 31, 2019 and 2018. Also excludes accounts receivable related to amounts due to the Company from product sales which are included in the accompanying consolidated balance sheets as of December 31, 2019 and 2018.

During the years ended December 31, 2019, 2018 and 2017, the Company recognized the following revenues as a result of changes in the contract asset and contract liability balances in the respective periods (in thousands):

Revenue Recognized in the Period from:	For the Year Ended December 31,		
	2019	2018	2017
Amounts included in deferred revenue at the beginning of the period	\$ 80,634	\$ 137,726	\$ 124,454
Performance obligations satisfied in previous periods	\$ 45,592	\$ 6,659	\$ 275

Mitsubishi Tanabe Pharma Corporation Collaboration Agreement

Summary of Agreement

On December 11, 2015, the Company and MTPC entered into a collaboration agreement, or the MTPC Agreement, providing MTPC with exclusive development and commercialization rights to vadadustat in Japan and certain other Asian countries, collectively, the MTPC Territory. In addition, the Company will supply vadadustat for both clinical and commercial use in the MTPC Territory, subject to MTPC's option to manufacture commercial drug product in the MTPC Territory.

The Company and MTPC agreed that, instead of including Japanese patients in the Company's global Phase 3 program for vadadustat, MTPC would be the sponsor of a Phase 3 program for vadadustat in Japan. MTPC reported top-line data for the two Phase 3 pivotal trials and data from the two supportive Phase 3 studies in March 2019 and 52-week data for the two Phase 3 pivotal trials in November 2019. MTPC is responsible for the costs of the Phase 3 program in Japan and other studies required in Japan, and will make no funding payments for the global Phase 3 program. In July 2019, MTPC submitted a Japanese New Drug Application, or JNDA, to the Ministry of Health, Labor and Welfare in Japan for manufacturing and marketing approval of vadadustat, as a treatment for anemia due to CKD, which triggered a \$10.0 million regulatory milestone payment to the Company.

MTPC has sole responsibility for the commercialization of vadadustat in the MTPC Territory as well as for Medical Affairs (as defined in the MTPC Agreement) in the MTPC Territory. Akebia is responsible for manufacturing and supplying vadadustat for clinical use in the MTPC Territory.

The Company and MTPC have established a joint steering committee pursuant to the MTPC Agreement to oversee development and commercialization of vadadustat in the MTPC Territory, including approval of any development or commercialization plans. Unless earlier terminated, the MTPC Agreement will continue in effect on a country-by-country basis until the later of the following: expiration of the last-to-expire patent covering vadadustat in such country in the MTPC Territory; expiration of marketing or regulatory exclusivity in such country in the MTPC Territory; or ten years after the first commercial sale of vadadustat in such country in the MTPC Territory. MTPC may terminate the MTPC Agreement upon twelve months' notice at any time after the second anniversary of the effective date of the MTPC Agreement. Either party may terminate the MTPC Agreement upon the material breach of the other party that is not cured within a specified time period or upon the insolvency of the other party.

MTPC is required to make certain milestone payments to the Company aggregating up to approximately \$225.0 million upon the achievement of specified development, regulatory and commercial events. More specifically, the Company received \$10.0 million in development milestone payments and is eligible to receive up to \$40.0 million in regulatory milestone payments, of which the Company received \$10.0 million in relation to the JNDA filing in the third quarter of 2019 and is eligible to receive an additional \$15.0 million upon regulatory approval of vadadustat in Japan, and up to \$175.0 million in commercial milestone payments associated with aggregate sales of all products. In consideration for the exclusive license and other rights contained in the MTPC Agreement, MTPC also made a \$20.0 million upfront payment as well as a payment of \$20.5 million for Phase 2 studies in Japanese patients completed by the Company and reimbursed by MTPC. Additionally, if vadadustat is commercialized, the Company would be entitled to receive tiered double-digit royalty payments of up to 20% on sales of vadadustat in the MTPC Territory. Royalty payments are subject to certain reductions, including upon the introduction of competitive products in certain instances. Royalties are due on a country-by-country basis from the date of first commercial sale of a licensed product in a country until the last to occur of: (i) the expiration of the last to expire valid claim within the intellectual property covering the licensed product, (ii) the expiration of marketing or regulatory exclusivity in such country, or (iii) the tenth anniversary of the first commercial sale of such licensed product in such country. Due to the uncertainty of pharmaceutical development and the high historical failure rates associated with drug development, although the Company has received \$10.0 million in development milestones and a \$10.0 million regulatory milestone, for which payment was received in the third quarter of 2019, no additional milestone or royalty payments may ever be received from MTPC.

In September 2017, the Company provided MTPC with an option to use data from the Company's global Phase 3 vadadustat program to obtain regulatory approval for vadadustat in Japan. If exercised, MTPC would make payments to the Company of up to \$25.0 million, which is in addition to the milestone payments described above.

Revenue Recognition

The Company evaluated the elements of the MTPC Agreement in accordance with the provisions of ASC 606 and concluded that the contract counterparty, MTPC, is a customer. The Company's arrangement with MTPC contains the following material promises under the contract at inception: (i) license under certain of the Company's intellectual property to develop and commercialize vadadustat (the License Deliverable) in the MTPC Territory, (ii) clinical supply of vadadustat (the Clinical Supply Deliverable), (iii) knowledge transfer, (iv) Phase 2 dosing study research services (the Research Deliverable), and (v) rights to future know-how.

The Company has identified two performance obligations in connection with its material promises under the MTPC Agreement as follows: (i) License, Research and Clinical Supply Performance Obligation and (ii) Rights to Future Know-How Performance Obligation. Factors considered in making the assessment of which material promises will be accounted for as separate performance obligations included, among other things, the capabilities of the collaboration partner, whether any other vendor sells the item separately, whether the good or service is highly interdependent or highly interrelated to the other elements in the arrangement, and whether there are other vendors that can provide the items. Additionally, the MTPC Agreement does not include a general right of return.

The Company allocates the transaction price to each performance obligation based on the Company's best estimate of the relative standalone selling price. The Company developed a best estimate of the standalone selling price for the Rights to Future Know-How Performance Obligation primarily based on the likelihood that additional intellectual property covered by the license conveyed will be developed during the term of the arrangement. The Company did not develop a best estimate of standalone selling price for the License, Research and Clinical Supply Performance Obligation because the estimate of standalone selling price associated with the Rights to Future Know-How Performance Obligation was determined to be immaterial. The Company has concluded that a change in the key assumptions used to determine the best estimate of standalone selling price for each performance obligation would not have a significant impact on the allocation of arrangement consideration. The deliverables associated with the License, Research and Clinical Supply Performance Obligation were satisfied as of June 30, 2018.

The transaction price at inception was comprised of: (i) the up-front payment, (ii) the estimated cost for the Phase 2 studies, (iii) a non-substantive milestone associated with the first patient enrolled in the NDD-CKD Phase 3 study, and (iv) the cost of all clinical supply provided to MTPC for the Phase 3 studies. No other development and no regulatory milestones were included in the transaction price at inception, as all other milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including that receipt of the milestones is outside the control of the Company and contingent upon success in future clinical trials and the licensee's efforts. The total aggregate amount of development milestones is \$10.0 million and the total aggregate amount of the regulatory milestones is up to \$40.0 million. The total aggregate amount of sales milestones is up to \$175.0 million. Any consideration related to sales-based milestones (including royalties) will be recognized when the related sales occur as they were determined to relate predominantly to the license granted to MTPC and therefore have also been excluded from the transaction price. The Company re-evaluates the transaction price in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

As of December 31, 2019, the transaction price is comprised of: (i) the up-front payment of \$20.0 million, (ii) the cost for the Phase 2 studies of \$20.5 million, (iii) the cost of all clinical supply provided to MTPC for the Phase 3 studies, (iv) \$10.0 million in development milestones received, comprised of a \$6.0 million and a \$4.0 million development milestone, and (v) the \$10.0 million regulatory milestone relating to the JNDA filing. As of December 31, 2019, all development milestones have been achieved and, other than the \$10.0 million regulatory milestone received by the Company related to the filing of the JNDA that was achieved, no other regulatory milestones have been assessed as probable of being achieved and as a result have been fully constrained. Revenue for the License, Research and Clinical Supply Performance Obligation for the MTPC Agreement is being recognized using a proportional performance method. Accordingly, the Company recognized the \$10.0 million regulatory milestone for the filing of the JNDA as revenue during the year ended December 31, 2019 as the regulatory milestone was both deemed probable of being achieved and the required performance obligations had been satisfied as of December 31, 2019. The Company recognized approximately \$9.3 million and \$42.9 million during the years ended December 31, 2018 and 2017, respectively. The revenue is classified as collaboration revenue in the accompanying consolidated statements of operations. As of December 31, 2019, there is no deferred revenue, no accounts receivable, and no contract assets. There were no asset or liability balances classified as long-term in the consolidated balance sheet as of December 31, 2019.

U.S. Collaboration and License Agreement with Otsuka Pharmaceutical Co. Ltd.

Summary of Agreement

On December 18, 2016, the Company entered into a collaboration and license agreement with Otsuka, or the Otsuka U.S. Agreement. The collaboration is focused on the development and commercialization of vadadustat in the United States. Under the terms of the Otsuka U.S. Agreement, the Company is responsible for leading the development of vadadustat, including the ongoing Phase 3 development program. The Company and Otsuka will co-commercialize vadadustat in the United States, subject to the approval of vadadustat by the FDA.

Under the terms of the Otsuka U.S. Agreement, the Company granted to Otsuka a co-exclusive, non-sublicensable license under certain intellectual property controlled by the Company solely to perform medical affairs activities and to conduct non-promotional and commercialization activities related to vadadustat in accordance with the associated plans. The co-exclusive license relates to activities that will be jointly conducted by the Company and Otsuka pursuant to the terms of the Otsuka U.S. Agreement. Additionally, the parties agreed not to promote, market or sell any competing product in the territory covered by the agreement.

The Company is responsible for performing all activities related to the development of vadadustat as outlined in the current global development plan. The current global development plan encompasses all activities with respect to the ongoing PRO₂TECT and INNO₂VATE clinical programs through the filing for marketing approval, as well as certain other studies. Under the Otsuka U.S. Agreement, the Company controls and retains final decision-making authority with respect to certain matters. The Company's obligations related to the conduct of the current global development plan include the associated manufacturing and supply services for vadadustat.

Under the Otsuka U.S. Agreement, the parties jointly conduct, and have equal responsibility for, all medical affairs, commercialization and non-promotional activities pursuant to underlying plans as agreed to by the parties. If approved by the FDA, the Company plans to provide vadadustat to Otsuka for commercialization pursuant to a separate supply agreement to be negotiated.

The activities under the Otsuka U.S. Agreement are governed by a joint steering committee, or JSC, formed by an equal number of representatives from the Company and Otsuka. The JSC coordinates and monitors the parties' activities under the collaboration. Among other responsibilities, the JSC manages the overall strategic alignment between the parties, oversees the current global development plan and reviews other detailed plans setting forth the parties' activities under the arrangement, including the medical affairs plan and commercialization and non-promotional activities plan. Additionally, the parties established a joint development committee, or JDC, which is comprised of an equal number of representatives from the Company and Otsuka. Among other responsibilities, the JDC shares information related to, and reviews and discusses activities and progress under, the current global

development plan and any other development that may be conducted pursuant to the collaboration. The Company and Otsuka also established a joint manufacturing committee, or JMC, which is comprised of an equal number of representatives from each of the parties. Among other responsibilities, the JMC oversees the manufacturing plan and related manufacturing activities. In support of the potential commercialization of vadadustat, the parties established a joint commercialization committee, or JCC, which is comprised of an equal number of representatives from the Company and Otsuka. Among other responsibilities, the JCC oversees the activities and progress under the commercialization and non-promotional activities plan and all other sales and marketing activities. The Company has retained final decision-making authority with respect to certain matters, including U.S. pricing strategy and certain other key commercialization matters.

Under the terms of the Otsuka U.S. Agreement, the Company received a \$125.0 million up-front, non-refundable, non-creditable cash payment in December 2016. In March 2017, the Company received a payment of approximately \$33.8 million, which represented reimbursement for Otsuka's share of costs previously incurred by the Company in implementing the current global development plan through December 31, 2016. Commencing in the third quarter of 2017, whereupon the Company had incurred a specified amount of incremental costs, Otsuka began to contribute, as required by the Otsuka U.S. Agreement, a percentage of the remaining costs incurred under the current global development plan. The Company estimates that Otsuka's funding of the current global development plan costs subsequent to December 31, 2016 will total \$266.8 million or more, depending on the actual costs incurred toward the current global development plan. The costs associated with the performance of any development activities in addition to those outlined in the current global development plan will be subject to a cost sharing or reimbursement mechanism as set forth in the Otsuka U.S. Agreement or to be determined by the parties. Costs incurred with respect to medical affairs and commercialization and non-promotional activities will generally be shared equally by the parties. In addition, due to the costs incurred in completing the activities under the current global development plan exceeding a certain threshold in the second quarter of 2019, the Company elected to require Otsuka to increase the aggregate percentage of current global development costs it funds under the Otsuka U.S. Agreement and the Otsuka International Agreement, as defined below, from 52.5% to 80%, or the Otsuka Funding Option. The Company estimates the additional funding as a result of exercising the Otsuka Funding Option, or the Additional Funding, to total approximately \$104.2 million or more, depending on the actual costs incurred toward the current global development plan. The Additional Funding is fully creditable against future payments due to the Company under the arrangement, provided that future payments due to the Company may not be reduced by more than 50% in any calendar year and any remaining creditable amount above 50% in any calendar year will be applied to subsequent future payments until fully credited. As of December 31, 2019, the Additional Funding was \$43.7 million.

In addition, Otsuka is required to make certain milestone payments to the Company upon the achievement of specified development, regulatory and commercial events. More specifically, the Company is eligible to receive up to \$125.0 million in development milestone payments and up to \$65.0 million in regulatory milestone payments for the first product to achieve the associated event. Moreover, the Company is eligible for up to \$575.0 million in commercial milestone payments associated with aggregate sales of licensed products, subject to reduction as a result of the Company's exercise of the Otsuka Funding Option, as described above, the Additional Funding for which, as of December 31, 2019, totaled \$43.7 million. Due to the uncertainty of pharmaceutical development and the high historical failure rates associated therewith, no milestone payments may ever be received from Otsuka.

Under the Otsuka U.S. Agreement, the Company and Otsuka share the costs of developing and commercializing vadadustat in the United States and the profits from the sales of vadadustat after approval by the FDA. In connection with the profit share calculation, net sales include gross sales to third-party customers net of discounts, rebates, chargebacks, taxes, freight and insurance charges and other applicable deductions. Shared costs generally include costs attributable or reasonably allocable to the manufacture of vadadustat for commercialization purposes and the performance of medical affairs activities, non-promotional activities and commercialization activities.

Unless earlier terminated, the Otsuka U.S. Agreement will expire in the United States on a product-by-product basis on the date that one or more generic versions of vadadustat first achieves 90% market penetration. Either party may terminate the Otsuka U.S. Agreement in its entirety upon an uncured breach or insolvency on the part of the other party. Otsuka may terminate the Otsuka U.S. Agreement in its entirety upon 12 months' prior written notice at any time after the release of the first topline data from the global Phase 3 development program for vadadustat. In the event of termination of the Otsuka U.S. Agreement, all rights and licenses granted to Otsuka under the Otsuka U.S. Agreement will automatically terminate and the licenses granted to the Company will become freely sublicensable. In addition, the upfront payment, all development costs and milestone payments received by the Company prior to such termination will not be refunded to Otsuka.

Revenue Recognition

The Company evaluated the elements of the Otsuka U.S. Agreement in accordance with the provisions of ASC 606 and concluded that the contract counterparty, Otsuka, is a customer. The Company's arrangement with Otsuka contains the following material promises under the contract at inception: (i) license under certain of the Company's intellectual property to develop, perform medical affairs activities with respect to and conduct non-promotional and commercialization activities related to vadadustat and products containing or comprising vadadustat (the License Deliverable), (ii) development services to be performed pursuant to the current global development plan (the Development Services Deliverable), (iii) rights to future intellectual property (the Future IP Deliverable), and (iv) joint committee services (the Committee Deliverable).

The Company has identified three performance obligations in connection with its obligations under the Otsuka U.S. Agreement. Factors considered in making the assessment of which material promises will be accounted for as separate performance obligations included, among other things, the capabilities of the collaboration partner, whether any other vendor sells the item separately, whether the good or service is highly interdependent or highly interrelated to the other elements in the arrangement, and whether there are other vendors that can provide the items. Additionally, the Otsuka U.S. Agreement does not include a general right of return. The three performance obligations identified in connection with the Company's obligations under the Otsuka U.S. Agreement are as follows:

(i) *License and Development Services Combined (License Performance Obligation)*

The License Deliverable is not distinct from the Development Services Deliverable, due to the limitations inherent in the license conveyed. More specifically, the license conveyed to Otsuka does not provide Otsuka with the right to manufacture vadaustat and products containing or comprising vadaustat. However, the manufacturing and supply services that are conducted as part of the services to be performed pursuant to the current global development plan are necessary for Otsuka to fully exploit the associated license for its intended purpose. The value of the rights provided through the license conveyed will be realized when the underlying products covered by the intellectual property progress through the development cycle, receive regulatory approval and are commercialized. Products containing or comprising vadaustat cannot be commercialized until the development services under the current global development plan are completed. Accordingly, Otsuka must obtain the manufacturing and supply of the associated products that are included within the development services to be performed pursuant to the current global development plan from the Company in order to derive benefit from the license, which significantly limits the ability for Otsuka to utilize the License Deliverable for its intended purpose in a way that generates economic benefits.

(ii) *Rights to Future Intellectual Property (Future IP Performance Obligation)*

The License and Development Services deliverables combined are distinct from the Future IP Deliverable because Otsuka can obtain the value of the license using the clinical trial materials implicit in the development services without the receipt of any other intellectual property that may be discovered or developed in the future. The Future IP Deliverable is distinct from the Committee Deliverable because the joint committee services have no bearing on the value to be derived from the rights to potential future intellectual property. As a result, the Future IP Deliverable qualifies as a separate performance obligation.

(iii) *Joint Committee Services (Committee Performance Obligation)*

The License and Development Services deliverables combined are distinct from the Committee Deliverable because Otsuka can obtain the value of the license using the clinical trial materials implicit in the development services without the joint committee services. The Committee Deliverable also is distinct from the rights to Future IP Deliverable because the joint committee services have no bearing on the value to be derived from the rights to potential future intellectual property. As a result, the Committee Deliverable qualifies as a separate performance obligation.

The Company allocates the transaction price to each performance obligation based on the Company's best estimate of the relative standalone selling price. The Company developed a best estimate of standalone selling price for the Committee Performance Obligation after considering the nature of the services to be performed and estimates of the associated effort and rates applicable to such services that would be expected to be realized under similar contracts. The Company developed a best estimate of standalone selling price for the Future IP Performance Obligation primarily based on the likelihood that additional intellectual property covered by the license conveyed will be developed during the term of the arrangement. The Company did not develop a best estimate of standalone selling price for the License Performance Obligation due to the following: (i) the best estimates of standalone selling price associated with the Future IP Performance Obligation was determined to be immaterial and (ii) the period of performance and pattern of recognition for the License Performance Obligation and the Committee Performance Obligation was determined to be similar. The Company has concluded that a change in the key assumptions used to determine the best estimate of standalone selling price for each performance obligation would not have a significant impact on the allocation of arrangement consideration.

The transaction price at inception was comprised of: (i) the up-front payment, (ii) the cost share payment with respect to amounts incurred by the Company through December 31, 2016, and (iii) an estimate of the cost share payments to be received with respect to amounts incurred by the Company subsequent to December 31, 2016. No development or regulatory milestones were included in the transaction price at inception, as all milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including that receipt of the milestones is outside the control of the Company and contingent upon success in future clinical trials and the licensee's efforts. Any consideration related to sales-based milestones will be recognized when the related sales occur as they were determined to relate predominantly to the license granted to Otsuka and therefore have also been excluded from the transaction price.

The Company re-evaluates the transaction price in each reporting period and as uncertain events are resolved or other changes in circumstances occur. The Company determined that under ASC 606, the contract was modified in the second quarter of 2019 when the Otsuka Funding Option became effective and the Company became eligible to receive the Additional Funding amount. In connection with the modification, the Company adjusted the transaction price to include the Additional Funding amount as additional variable consideration. The Company constrains the variable consideration to an amount for which a significant revenue reversal is not probable.

No amounts were allocated to the Future IP Performance Obligation because the associated best estimate of standalone selling price was determined to be immaterial. Due to the similar performance period and recognition pattern between the License Performance Obligation and the Committee Performance Obligation, the transaction price has been allocated to the License Performance Obligation and the Committee Performance Obligation on a combined basis. Accordingly, the Company will recognize revenue related to the allocable arrangement consideration on a proportional performance basis as the underlying development services are performed pursuant to the current global development plan which is commensurate with the period and consistent with the pattern over which the Company's obligations are satisfied for both the License Performance Obligation and the Committee Performance Obligation. Effectively, the Company has treated the arrangement as if the License Performance Obligation and the Committee Performance Obligation are a single performance obligation.

As of December 31, 2019, the transaction price totaling \$425.6 million is comprised of: (i) the up-front payment of \$125.0 million, (ii) the cost share payment with respect to amounts incurred by the Company through December 31, 2016 of \$33.8 million, (iii) the estimate of the cost base share payments to be received of approximately \$209.1 million with respect to amounts incurred by the Company subsequent to December 31, 2016, and (iv) the estimate of the Additional Funding of approximately \$57.7 million related to incremental cost share payments under the Otsuka Funding Option described above. As of December 31, 2019, no development or regulatory milestones have been assessed as probable of being reached and thus have been fully constrained.

During the years ended December 31, 2019, 2018 and 2017, the Company recognized revenue totaling approximately \$131.3 million, \$103.9 million and \$86.0 million, respectively, with respect to the Otsuka U.S. Agreement. The revenue is classified as collaboration revenue in the accompanying consolidated statements of operations. As of December 31, 2019, there is approximately \$44.2 million of deferred revenue related to the Otsuka U.S. Agreement of which \$23.6 million is classified as current and \$20.6 million is classified as long-term in the accompanying consolidated balance sheet based on the performance period of the underlying obligations. Additionally, as of December 31, 2019, there is approximately \$8.9 million in accounts receivable in the accompanying consolidated balance sheet. As of December 31, 2018, there was approximately \$7.2 million in contract liabilities (included in accounts payable) in the consolidated balance sheet.

The Company determined that the medical affairs, commercialization and non-promotional activities elements of the Otsuka U.S. Agreement represent joint operating activities in which both parties are active participants and of which both parties are exposed to significant risks and rewards that are dependent on the success of the activities. Accordingly, the Company is accounting for the joint medical affairs, commercialization and non-promotional activities in accordance with ASC No. 808, *Collaborative Arrangements* (ASC 808). Additionally, the Company has determined that in the context of the medical affairs, commercialization and non-promotional activities, Otsuka does not represent a customer as contemplated by ASC 606-10-15, *Revenue from Contracts with Customers – Scope and Scope Exceptions*. As a result, the activities conducted pursuant to the medical affairs, commercialization and non-promotional activities plans will be accounted for as a component of the related expense in the period incurred. During the years ended December 31, 2019 and 2018, the Company incurred approximately \$1.8 million and \$1.2 million, respectively, of costs related to the cost-sharing provisions of the Otsuka U.S. Agreement of which approximately \$0.7 million and \$0.5 million are reimbursable by Otsuka and recorded as a reduction to research and development expense during each of the years ended December 31, 2019 and 2018, respectively. During the years ended December 31, 2019 and 2018, Otsuka incurred approximately \$1.9 million and \$1.1 million, respectively, of costs related to the cost-sharing provisions of the Otsuka U.S. Agreement, of which approximately \$1.0 million and \$0.5 million are reimbursable by the Company and recorded as an increase to research and development expense during the years ended December 31, 2019 and 2018.

International Collaboration and License Agreement with Otsuka Pharmaceutical Co. Ltd.

Summary of Agreement

On April 25, 2017, the Company entered into a collaboration and license agreement with Otsuka, or the Otsuka International Agreement. The collaboration is focused on the development and commercialization of vadadustat in Europe, Russia, China, Canada, Australia, the Middle East and certain other territories, collectively, the Otsuka International Territory. Under the terms of the Otsuka International Agreement, the Company is responsible for leading the development of vadadustat, including the ongoing global Phase 3 development program. Otsuka has the sole responsibility, at its own cost, for the commercialization of vadadustat in the Otsuka International Territory, subject to the approval by the relevant regulatory authorities.

Under the terms of the Otsuka International Agreement, the Company granted to Otsuka an exclusive, sublicensable license under certain intellectual property controlled by the Company to develop and commercialize vadadustat and products containing or comprising vadadustat in the Otsuka International Territory.

Pursuant to the terms of the Otsuka International Agreement, the Company is responsible for performing all activities related to the development of vadadustat as outlined in the current global development plan; however, the parties may agree to allocate certain responsibilities to Otsuka. Under the Otsuka International Agreement, the Company controls and retains final decision-making authority with respect to certain matters. Per the terms of the Otsuka International Agreement, Otsuka is generally responsible for the conduct of any development activities that may be required for marketing approvals in the Otsuka International Territory or otherwise performed with respect to the Otsuka International Territory that are incremental to those included in the current global development plan. The Company's obligations related to the conduct of the current global development plan include the associated manufacturing and supply services for vadadustat.

Under the Otsuka International Agreement, Otsuka is to be solely responsible for the conduct of all medical affairs and commercialization activities in the Otsuka International Territory pursuant to underlying plans as reviewed and discussed by the parties. If approved by the relevant jurisdictional regulatory health authorities in the Otsuka International Territory, the Company will provide vadadustat to Otsuka for commercialization pursuant to a separate supply agreement to be negotiated. Additionally, the parties agreed not to promote, market or sell any competing product in the territory covered by the agreement.

The activities under the Otsuka International Agreement are governed by a JSC formed by an equal number of representatives from the Company and Otsuka. The JSC coordinates and monitors the parties' activities under the collaboration. Among other responsibilities, the JSC manages the overall strategic alignment between the parties, oversees the current global development plan and reviews other detailed plans setting forth any other development activities that may be conducted under the arrangement. Additionally, the parties established a JDC, which is comprised of an equal number of representatives from the Company and Otsuka. Among other responsibilities, the JDC shares information related to, and reviews and discusses activities and progress under, the current global development plan and any other development that may be conducted pursuant to the collaboration. The Company and Otsuka also established a JMC, which is comprised of an equal number of representatives from each of the parties. Among other responsibilities, the JMC oversees the manufacturing plan and related manufacturing activities. In support of the potential commercialization of vadadustat, the parties established a JCC, which is comprised of an equal number of representatives from the Company and Otsuka. Among other responsibilities, the JCC manages the activities and progress under the commercialization and non-promotional activities plan and all other sales and marketing activities. The Company has retained final decision-making authority with respect to certain matters. Otsuka has retained final decision-making authority with respect to all commercialization matters, other than decisions related to certain marketing matters.

Under the terms of the Otsuka International Agreement, the Company received a \$73.0 million up-front, non-refundable, non-creditable cash payment. The Company also received a payment of approximately \$0.2 million which represents reimbursement for Otsuka's share of costs previously incurred by the Company in implementing the current global development plan in excess of a specified threshold during the quarter ended March 31, 2017. Commencing in the second quarter of 2017, Otsuka began to contribute, as required by the Otsuka International Agreement, a percentage of the remaining costs incurred under the current global development plan. The Company estimates that Otsuka's funding of the current global development plan costs subsequent to March 31, 2017 will total roughly \$214.0 million or more, depending on the actual current global development plan costs incurred. The costs associated with the performance of any mutually agreed upon development activities in addition to those outlined in the current global development plan will be subject to a cost sharing or reimbursement mechanism as set forth in the Otsuka International Agreement or to be determined by the parties. Otsuka may elect to conduct additional studies of vadadustat in the EU, subject to the Company's right to delay such studies based on its objectives outside the Otsuka International Territory. Otsuka will pay a percentage of the costs of any such studies, and the Company will pay its portion of the costs in the form of a credit against future amounts due to the Company under the Otsuka International Agreement. The costs incurred related to any other development activities, which are pursued solely for obtaining or maintaining marketing approval in the Otsuka International Territory or otherwise performed solely with respect to the Otsuka International Territory that are incremental to the development activities included in the current global development plan, will be borne in their entirety by Otsuka. Otsuka will pay costs incurred with respect to medical affairs and commercialization activities in the Otsuka International Territory.

In addition, Otsuka would be required to make certain milestone payments to the Company upon the achievement of specified development, regulatory and commercial events. More specifically, the Company is eligible to receive up to \$80.0 million in development milestone payments and up to \$52.0 million in regulatory milestone payments for the first licensed product to achieve the associated event. Moreover, the Company is eligible for up to \$525.0 million in commercial milestone payments associated with aggregate sales of all licensed products. Additionally, to the extent vadadustat is commercialized, the Company would be entitled to receive tiered royalty payments ranging from the low double digits to the low thirties based on a percentage of net sales. Royalties are due on a country-by-country basis from the date of the first commercial sale of a licensed product in a country until the latest to occur of: (i) the expiration date in such country of the last to expire valid claim within the intellectual property covering the licensed product, (ii) the date of expiration of data or regulatory exclusivity in such country or (iii) the tenth anniversary of the first commercial sale of such licensed product in such country. Due to the uncertainty of pharmaceutical development and the high historical failure rates associated therewith, no milestone or royalty payments may ever be received from Otsuka. There are no cancellation, termination or refund provisions in the Otsuka International Agreement that contain material financial consequences to the Company.

Unless earlier terminated, the Otsuka International Agreement will expire upon the expiration of the royalty term in the last country in the Otsuka International Territory. Either party may terminate the Otsuka International Agreement in its entirety upon an uncured material breach or insolvency on the part of the other party. Otsuka may terminate the Otsuka International Agreement in its entirety or for a specific region in the Otsuka International Territory upon 12 months' prior written notice at any time after the release of the first topline data from either the PRO₂TECT Phase 3 development program or the INNO₂VATE Phase 3 development program, whichever comes first. In the event of termination of the Otsuka International Agreement, all rights and licenses granted to Otsuka under the Otsuka International Agreement will automatically terminate, and the licenses granted to the Company will become freely sublicensable, but potentially subject to a future royalty. In addition, the upfront payment, all development costs and milestone payments received by the Company prior to such termination will not be eligible for refund to Otsuka.

Revenue Recognition

The Company has accounted for the Otsuka International Agreement separately from the collaboration arrangement with Otsuka with respect to the U.S. due to the lack of interrelationship and interdependence of the elements and payment terms within each of the contracts as they relate to the respective territories. Accordingly, the Company has applied the guidance in ASC 606 solely in reference to the terms and conditions of the Otsuka International Agreement, while the Otsuka U.S. Agreement has continued to be accounted for as a discrete agreement in its own right. The Company evaluated the Otsuka International Agreement in accordance with the provisions of ASC 606 and concluded that the contract counterparty, Otsuka, is a customer. The Company's arrangement with Otsuka related to the Otsuka International Territory contains the following material promises under the contract at inception: (i) license under certain of the Company's intellectual property to develop and commercialize (including the associated packaging) vadadustat and products containing or comprising vadadustat and development services to be performed pursuant to the current global development plan (the License and Development Services Deliverable), (ii) rights to future intellectual property (the Future IP Deliverable) and (iii) joint committee services (the Committee Deliverable).

The Company has identified three performance obligations in connection with its obligations under the Otsuka International Agreement. Factors considered in making this assessment of which material promises will be accounted for as a separate performance obligation included, among other things, the capabilities of the collaboration partner, whether any other vendor sells the item separately, whether the good or service is highly interdependent or highly interrelated to the other elements in the arrangement, and whether there are other vendors that can provide the items. Additionally, the Otsuka International Agreement does not include a general right of return. The three performance obligations identified in connection with the Company's obligations under the Otsuka International Agreement are as follows:

(i) *License and Development Services Combined (License Performance Obligation)*

The Company has determined that the license granted to Otsuka pursuant to the Otsuka International Agreement will be accounted for as component of the development services as opposed to a separately identified promise. Although the rights granted under the license are effective throughout the entire term of the arrangement, the Company will not be providing significant additional contributions of study data, regulatory submissions and regulatory approvals beyond the point that services under the current global development plan are conducted. Therefore, the period and pattern of recognition would be the same for both the license and the development services. Consequently, the Company has concluded that the license will effectively be treated as an inherent part of the associated development services promise instead of as a separate promise. As a result, the License and Development Services Deliverable will be treated as a single performance obligation (the License Performance Obligation).

(ii) *Rights to Future Intellectual Property (Future IP Performance Obligation)*

The License and Development Services Deliverable is distinct from the Future IP Deliverable because Otsuka can obtain the value of the license using the clinical trial materials implicit in the development services without the receipt of any other intellectual property that may be discovered or developed in the future. The Future IP Deliverable is distinct from the Committee Deliverable because the Committee Deliverable has no bearing on the value to be derived from the rights to potential future intellectual property. As a result, the Future IP Deliverable qualifies as a separate performance obligation.

(iii) *Joint Committee Services (Committee Performance Obligation)*

The License and Development Services Deliverable is distinct from the Committee Deliverable because Otsuka can obtain the value of the license using the clinical trial materials implicit in the development service without the joint committee services. The Committee Deliverable is distinct from the Future IP Deliverable because the Committee Deliverable has no bearing on the value to be derived from the rights to potential future intellectual property. As a result, the Committee Deliverable qualifies as a separate performance obligation.

The Company allocates the transaction price to each performance obligation based on the Company's best estimate of the relative standalone selling price. The Company developed a best estimate of standalone selling price for the Committee Performance Obligation after considering the nature of the services to be performed and estimates of the associated effort and rates applicable to such services that would be expected to be realized under similar contracts. The Company developed a best estimate of standalone selling price for the Future IP Performance Obligation primarily based on the likelihood that additional intellectual property covered by the license conveyed will be developed during the term of the arrangement. The Company did not develop a best estimate of standalone selling price for the License Performance Obligation due to the following: (i) the best estimates of standalone selling price associated with the Future IP Performance Obligation was determined to be immaterial and (ii) the period of performance and pattern of recognition for the License Performance Obligation and the Committee Performance Obligation was determined to be similar. The Company has concluded that a change in the key assumptions used to determine the best estimate of standalone selling price for each performance obligation would not have a significant impact on the allocation of arrangement consideration.

The transaction price at inception was comprised of: (i) the up-front payment, (ii) the cost share payment with respect to amounts incurred by the Company during the quarter ended March 31, 2017, and (iii) an estimate of the cost share payments to be received with respect to amounts incurred by the Company subsequent to March 31, 2017. No development or regulatory milestones were included in the transaction price at inception, as all milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including whether the receipt of the milestone payment is outside the control of the Company and contingent upon success in future clinical trials and the licensee's efforts. Any consideration related to sales-based milestones (including royalties) will be recognized when the related sales occur as they were determined to relate predominantly to the license granted to Otsuka and therefore have also been excluded from the transaction price. The Company re-evaluates the transaction price in each reporting period and as uncertain events are resolved or other changes in circumstances occur.

No amounts were allocated to the Future IP Performance Obligation because the associated best estimate of standalone selling price was determined to be immaterial. Due to the similar performance period and recognition pattern between the License Performance Obligation and the Committee Performance Obligation, the transaction price has been allocated to the License Performance Obligation and the Committee Performance Obligation on a combined basis. Accordingly, the Company will recognize revenue related to the allocable arrangement consideration on a proportional performance basis as the underlying development services are performed pursuant to the current global development plan which is commensurate with the period and consistent with the pattern over which the Company's obligations are satisfied for both the License Performance Obligation and the Committee Performance Obligation. Effectively, the Company has treated the arrangement as if the License Performance Obligation and the Committee Performance Obligation are a single performance obligation.

As of December 31, 2019, the transaction price totaling \$287.2 million is comprised of: (i) the up-front payment of \$73.0 million, (ii) the cost share payment with respect to amounts incurred by the Company during the quarter ended March 31, 2017 of \$0.2 million, and (iii) an estimate of the cost share payments to be received with respect to amounts incurred by the Company subsequent to March 31, 2017 of \$214.0 million. As of December 31, 2019, no development or regulatory milestones have been assessed as probable of being reached and thus have been fully constrained.

During the years ended December 31, 2019, 2018 and 2017, the Company recognized revenue totaling approximately \$75.6 million, \$87.3 million, and \$52.3 million, respectively, with respect to the Otsuka International Agreement. The revenue is classified as collaboration revenue in the accompanying consolidated statements of operations. As of December 31, 2019, there is approximately \$24.1 million of deferred revenue related to the Otsuka International Agreement of which \$16.3 million is classified as current and \$7.8 million is classified as long-term in the accompanying consolidated balance sheet based on the performance period of the underlying obligations. Additionally, as of December 31, 2019, there is approximately \$4.0 million in accounts receivable in the accompanying consolidated balance sheet. As of December 31, 2018, there was approximately \$6.3 million in contract liabilities (included in accounts payable) in the consolidated balance sheet.

Janssen Pharmaceutica NV Research and License Agreement

Summary of Agreement

On February 9, 2017, the Company entered into a Research and License Agreement, the Janssen Agreement, with Janssen Pharmaceutica NV, or Janssen, a subsidiary of Johnson & Johnson, pursuant to which Janssen granted the Company an exclusive license under certain intellectual property rights to develop and commercialize worldwide certain HIF prolyl hydroxylase targeted compounds.

Under the terms of the Janssen Agreement, Janssen granted to the Company a license for a three-year research term to conduct research on the HIF compound portfolio, which research term is now expired. During the research term, the Company could designate one or more compounds as candidates for development and commercialization. Once a compound was designated for development and commercialization, the Company was to be solely responsible for the development and commercialization of the compound worldwide at its own cost and expense.

Under the terms of the Janssen Agreement, the Company made an upfront payment of \$1.0 million in cash to Janssen and issued a warrant to purchase 509,611 shares of the Company's common stock. In addition, Janssen could be eligible to receive up to an aggregate of \$16.5 million from the Company in specified development milestone payments on a product-by-product basis. Janssen will also be eligible to receive up to \$215.0 million from the Company in specified commercial milestones as well as tiered, escalating royalties ranging from a low to mid-single digit percentage of net sales, on a product-by-product basis, and subject to reduction upon expiration of patent rights or the launch of a generic product in the territory.

Unless earlier terminated, the Janssen Agreement will expire on a product-by-product and country-by-country basis upon the expiration of the last royalty term, which ends upon the longer of the expiration of the patents licensed under the Janssen Agreement, the expiration of regulatory exclusivity for such product, or 10 years from first commercial sale of such product. The Company may terminate the Janssen Agreement in its entirety or only with respect to a particular licensed compound or product upon 180 days' prior written notice to Janssen. The parties also have customary termination rights, subject to a cure period, in the event of the other party's material breach of the Janssen Agreement or in the event of certain additional circumstances.

As discussed above, the Company issued a Common Stock Purchase Warrant, or the Warrant, to Johnson & Johnson Innovation – JJDC, Inc., or JJDC, an affiliate of Janssen, for 509,611 shares of the Company's common stock at an exercise price of \$9.81 per share. The Warrant is exercisable by JJDC, in whole or in part, at any time prior to February 9, 2022. The Warrant and the shares issuable upon exercise of the Warrant will be sold and issued without registration under the Securities Act of 1933, as amended, or the Securities Act. The Company recorded the fair value of the Warrant in the amount of \$3.4 million to additional paid-in capital and research and development expense in March 2017.

Vifor Pharma License Agreement

Summary of Agreement

On May 12, 2017, the Company entered into a License Agreement, or the Vifor Agreement, with Vifor (International) Ltd., or Vifor Pharma, pursuant to which the Company granted Vifor Pharma an exclusive license to sell vadadustat solely to Fresenius Kidney Care Group LLC, or FKC, an affiliate of Fresenius Medical Care North America, or FMCNA, in the United States. On April 8, 2019, the Company and Vifor Pharma entered into an Amended and Restated License Agreement, or the Vifor Amended Agreement, which amends and restates in full the Vifor Agreement.

Pursuant to the Vifor Amended Agreement, the Company granted Vifor Pharma an exclusive license to sell vadadustat to FKC and to certain third party dialysis organizations approved by the Company, or Third Party Dialysis Organizations, in the United States.

The license granted under the Vifor Amended Agreement will become effective upon (i) the approval of vadadustat for DD-CKD patients by the FDA, (ii) the earlier of a determination by the Centers for Medicare & Medicaid Services that vadadustat will be reimbursed using Medicare's bundled reimbursement model or that vadadustat will be reimbursed using the Transitional Drug Add-On Payment Adjustment, and (iii) payment by Vifor Pharma of a \$25.0 million milestone upon the occurrence of (i) and (ii).

The Vifor Amended Agreement is structured as a profit share arrangement between the Company and Vifor Pharma in which the Company will receive a majority of the profit, after deduction of certain amounts relating to Vifor Pharma's costs, from Vifor Pharma's sales of vadadustat to FKC and the Third Party Dialysis Organizations in the United States. The Company will share the milestone payment and the revenue from the profit share with Otsuka pursuant to the Otsuka U.S. Agreement. The Company currently retains rights to commercialize vadadustat for use in the NDD-CKD market and in other dialysis organizations in the United States, which will be done in collaboration with Otsuka following FDA approval.

The Vifor Amended Agreement provides that the Company and Vifor Pharma will enter into a commercial supply agreement for vadadustat pursuant to which the Company will supply all of Vifor Pharma's requirements for vadadustat in the United States. In addition, Vifor Pharma will enter into supply arrangements with FKC and the Third Party Dialysis Organizations that will govern the terms pursuant to which Vifor Pharma will supply vadadustat to FKC and the Third Party Dialysis Organizations for use in patients at its dialysis centers in the United States. During the term of the Vifor Amended Agreement, Vifor Pharma is not permitted to sell any HIF product that competes with vadadustat in the United States to FKC or its affiliates or to any Third Party Dialysis Organization,

and the Company may not directly supply vadadustat to FKC or any other affiliate of FMCNA or any Third Party Dialysis Organization.

Unless earlier terminated, the Vifor Amended Agreement will expire upon the later of the expiration of all patents that claim or cover vadadustat or expiration of marketing or regulatory exclusivity for vadadustat in the United States. Vifor Pharma may terminate the Vifor Amended Agreement in its entirety upon 12 months' prior written notice after the release of the first topline data in the vadadustat global Phase 3 program for DD-CKD patients. In addition, either party may, subject to a cure period, terminate the Vifor Amended Agreement in the event of the other party's uncured material breach or bankruptcy. The Company may terminate the Vifor Amended Agreement (or suspend the license) upon the occurrence of certain events, such as for specific violations of the Vifor Amended Agreement, Vifor Pharma's failure to achieve certain sales levels, or if there are changes in Vifor Pharma's relationship with FKC or in applicable laws and regulations related to the reimbursement of drugs like vadadustat at dialysis clinics, or if Vifor Pharma contests the validity or enforceability of any patent controlled by the Company that covers vadadustat. The Vifor Amended Agreement also includes a standstill provision and customary representations and warranties.

Investment Agreement

In connection with the Vifor Agreement, in May 2017, the Company and Vifor Pharma entered into an investment agreement, or the Investment Agreement, pursuant to which the Company sold an aggregate of 3,571,429 shares of the Company's common stock, or the Shares, to Vifor Pharma at a price per share of \$14.00 for a total of \$50.0 million. The amount representing the premium over the closing stock price of \$12.69 on the date of the transaction, totaling \$4.7 million, was determined by the Company to represent consideration related to the Vifor Agreement. As the parties' rights under the Vifor Agreement are conditioned upon (a) the approval of vadadustat for DD-CKD patients by the FDA; (b) the earlier of a determination by the Centers for Medicare & Medicaid Services that vadadustat will be reimbursed using Medicare's bundled reimbursement model or that vadadustat will be reimbursed using the Transitional Drug Add-On Payment Adjustment; and (c) payment by Vifor Pharma of a \$25.0 million milestone upon the occurrence of (a) and (b), in accordance with ASC 606, the Company has determined that the full transaction price is fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including clinical and regulatory risks that must be overcome in order for the parties' rights to become effective and the probability of the \$25.0 million milestone being achieved. Accordingly, the \$4.7 million continues to be recorded as deferred revenue in the accompanying consolidated balance sheets. Upon the satisfaction of the aforementioned conditions, revenue will be recognized as the Company supplies vadadustat to Vifor Pharma using a proportional performance method.

Vifor Pharma agreed to a lock-up restriction such that it agrees not to sell the Shares for a period of time following the effective date of the Investment Agreement as well as a customary standstill agreement. In addition, the Investment Agreement contains voting agreements made by Vifor Pharma with respect to the Shares. The Shares have not been registered pursuant to the Securities Act, and were issued and sold in reliance upon the exemption from registration contained in Section 4(a)(2) of the Securities Act and Rule 506 promulgated thereunder.

Priority Review Voucher Letter Agreement

On February 14, 2020, we entered into a letter agreement, or the Letter Agreement, with Vifor Pharma relating to Vifor Pharma's agreement with a third party to purchase a Priority Review Voucher, or the PRV, issued by the FDA, subject to satisfaction of customary closing conditions, or the PRV Purchase. A PRV entitles the holder to priority review of a New Drug Application, or NDA, or a Biologics License Application for a new drug, which reduces the target FDA review time to six months after official acceptance of the submission, and could lead to expedited approval. Pursuant to the Letter Agreement, Akebia will pay Vifor Pharma \$10.0 million within fifteen business days after the closing of the PRV Purchase. Vifor Pharma is obligated to retain all rights to, and maintain the validity of, the PRV until Akebia and Vifor Pharma (a) enter into a definitive agreement setting forth the financial and other terms by which Vifor Pharma will assign the PRV to Akebia for use with Akebia's planned NDA for vadadustat for the treatment of anemia due to CKD in both dialysis-dependent and non-dialysis dependent patients, or (b) make a mutual decision to sell the PRV and share the proceeds based on certain terms.

License Agreement with Panion & BF Biotech, Inc.

As a result of the Merger, the Company had a license agreement, which was amended from time to time, with Panion & BF Biotech, Inc., or Panion, under which Keryx, the Company's wholly owned subsidiary, was the contracting party, or the Panion License Agreement, Keryx in-licensed the exclusive worldwide rights, excluding certain Asian-Pacific countries, or the Licensor Territory, for the development and commercialization of ferric citrate.

On April 17, 2019, the Company and Panion entered into a second amended and restated license agreement, or the Panion Amended License Agreement, which amends and restates in full the Panion License Agreement, effective as of April 17, 2019. The Panion

Amended License Agreement provides Keryx with an exclusive license under Panion-owned know-how and patents covering the rights to sublicense, develop, make, use, sell, offer for sale, import and export ferric citrate worldwide, excluding the Licensor Territory. The Panion Amended License Agreement also provides Panion with an exclusive license under Keryx-owned patents covering the rights to sublicense (with the Company's written consent), develop, make, use, sell, offer for sale, import and export ferric citrate in certain countries in the Licensor Territory. Consistent with the Panion License Agreement, under the Panion Amended License Agreement, Panion is eligible to receive from the Company or any sublicensee royalty payments based on a mid-single digit percentage of sales of ferric citrate in the Company's licensed territories. The Company is eligible to receive from Panion or any sublicensee royalty payments based on a mid-single digit percentage of net sales of ferric citrate in Panion's licensed territories.

The Panion Amended License Agreement terminates upon the expiration of each of the Company's and Panion's obligations to pay royalties thereunder. In addition, the Company may terminate the Panion Amended License Agreement (i) in its entirety or (ii) with respect to one or more countries in the Company's licensed territory, in either case upon 90 days' notice. The Company and Panion also each have the right to terminate the Panion Amended License Agreement upon the occurrence of a material breach of the Panion Amended License Agreement by the other party, subject to certain cure provisions, or certain insolvency events. The Panion Amended License Agreement also provides that, on a country-by-country basis, until the second anniversary of the expiration of the obligation of the Company or Panion, as applicable, to pay royalties in a country in which such party has ferric citrate for sale on the date of such expiration, neither the other party nor its affiliates will, directly or indirectly, sell, distribute or otherwise commercialize or supply or cause to supply ferric citrate to a third party for sale or distribution in such country.

The Panion Amended License Agreement includes customary terms relating to, among others, indemnification, confidentiality, remedies, and representations and warranties.

During the year ended December 31, 2019 and the period from December 12, 2018 to December 31, 2018, the Company incurred approximately \$10.2 million and \$0.4 million, respectively, in royalty payments due to Panion relating to the Company's sales of Auryxia in the United States and JT and Torii's net sales of Riona in Japan, as the Company is required to pay a mid-single digit percentage of net sales of ferric citrate in the Company's licensed territories to Panion under the terms of the Panion Amended License Agreement.

Sublicense Agreement with Japan Tobacco, Inc. and its subsidiary, Torii Pharmaceutical Co., Ltd.

Summary of Agreement

As a result of the Merger, the Company has an Amended and Restated Sublicense Agreement, which was amended in June 2013, with JT and Torii, or the JT and Torii Sublicense Agreement, under which Keryx, the Company's wholly owned subsidiary, remains the contracting party. Under the JT and Torii Sublicense Agreement, JT and Torii obtained the exclusive sublicense rights for the development and commercialization of ferric citrate hydrate in Japan. JT and Torii are responsible for the future development and commercialization costs in Japan.

Ferric citrate hydrate is currently approved by the Japanese Ministry of Health, Labour and Welfare for manufacturing and marketing in Japan for the treatment of hyperphosphatemia in patients with CKD. Ferric citrate hydrate is being marketed in Japan by Torii, under the brand name Riona. JT and Torii are currently conducting a Phase 3 clinical program evaluating Riona for the treatment of IDA in adult patients in Japan. JT and Torii have stated that, upon successful completion of its Phase 3 program, they expect to file an application for approval of IDA as an additional indication for Riona in Japan. The Company is eligible to receive royalty payments based on a tiered double-digit percentage of net sales of Riona in Japan escalating up to the mid-teens, subject to certain reductions upon expiration or termination of the Amended and Restated License Agreement between Keryx and Panion, by which Keryx in-licensed the exclusive worldwide rights, excluding certain Asian-Pacific countries, for the development and commercialization of ferric citrate. The Company is entitled to receive up to an additional \$55.0 million upon the achievement of certain annual net sales milestones.

The sublicense under the JT and Torii Sublicense Agreement terminates upon the expiration of all underlying patent rights. Also, JT and Torii may terminate the JT and Torii Sublicense Agreement with or without cause upon at least six months prior written notice to us. Additionally, either party may terminate the JT and Torii Sublicense Agreement for cause upon 60 days' prior written notice after the breach of any uncured material provision of the JT and Torii Sublicense Agreement, or after certain insolvency events.

Revenue Recognition

The Company evaluated the elements of the JT and Torii Sublicense Agreement in accordance with the provisions of ASC 606 and concluded that the contract counterparty, JT and Torii, is a customer. The Company's arrangement with JT and Torii contains the following material promises under the contract at inception: (i) exclusive license to develop and commercialize ferric citrate hydrate in Japan (the License Deliverable), (ii) supply of ferric citrate hydrate until JT and Torii could secure their own source (the Supply Deliverable), (iii) knowledge transfer, and (iv) rights to future know-how.

The Company identified two performance obligations in connection with its obligations under the JT and Torii Sublicense Agreement: (i) *License and Supply Performance Obligation* and (ii) *Rights to Future Know-How Performance Obligation*. The Company allocated the transaction price to each performance obligation based on the Company's best estimate of the relative standalone selling price. The Company developed a best estimate of the standalone selling price for the Rights to Future Know-How Performance Obligation primarily based on the likelihood that additional intellectual property covered by the license conveyed will be developed during the term of the arrangement and determined it immaterial. As such, the Company did not develop a best estimate of standalone selling price for the License and Supply Performance Obligation and allocated the entire transaction price to this performance obligation. Additionally, as of the consummation of the Merger, the services associated with the License and Supply Performance Obligation were completed and JT and Torii had secured their own source to manufacture ferric citrate hydrate. As such, any initial license fees as well as any development-based milestones and manufacturing fee revenue were received and recognized prior to the Merger. The Company determined that the remaining consideration that may be payable to the Company under the terms of the sublicense agreement are either quarterly royalties on net sales or payments due upon the achievement of sales-based milestones. In accordance with ASC 606, the Company recognizes sales-based royalties, including milestone payments based on the level of sales, when the related sales occur as these amounts have been determined to relate predominantly to the license granted to JT and Torii and therefore are recognized at the later of when the performance obligation is satisfied, or the related sales occur.

During the year ended December 31, 2019 and the period from December 12, 2018 to December 31, 2018, the Company recognized \$5.9 million and \$0.1 million, respectively, in license revenue related to royalties earned on net sales of Riona in Japan. The Company records the associated mid-single digit percentage of net sales royalty expense due to Panion, the licensor of Riona, in the same period as the royalty revenue from JT and Torii is recorded.

5. Business Combination

On December 12, 2018, the Company completed the Merger with Keryx. Keryx's proprietary product, Auryxia, is approved by the FDA for two indications: (1) the control of serum phosphorus levels in adult patients with DD-CKD and (2) the treatment of iron deficiency anemia in adult patients with NDD-CKD.

Akebia was determined to be the accounting acquirer and has accounted for the transaction as a business combination using the acquisition method of accounting under ASC 805. Accordingly, the results of Keryx's operations are included in our consolidated financial statements from December 12, 2018, the date the Merger was completed. Keryx's revenues and net loss from December 12, 2018 to December 31, 2018 were \$6.9 million and \$3.8 million, respectively.

Pursuant to the terms and conditions of the Merger Agreement, each outstanding Keryx Share, excluding the Baupost Additional Shares, as defined below, and each outstanding Keryx equity award were converted into Akebia Shares and substantially similar Akebia equity awards, respectively, at an exchange ratio of 0.37433 for a total fair value consideration of \$527.8 million consisting of the following (in thousands):

Fair value of 57,773,090 Akebia Shares	\$	516,492
Fair value of 602,752 Akebia RSUs		304
Fair value of 3,967,290 Akebia stock options		10,958
Total consideration	\$	527,754

The fair value of the Akebia common stock and Akebia awards issued was calculated using \$8.94 per share, the closing price of Akebia common stock on December 12, 2018. The portion of the fair value relating to the Akebia RSUs and stock options represents the fair value attributable to precombination employee services. The fair value relating to future employee service will be expensed as stock-based compensation on a straight-line basis over the remaining service periods of those awards.

Additionally, immediately prior to the Merger, Baupost Group Securities, L.L.C., or Baupost, agreed to convert its \$164.7 million of Keryx's Convertible Notes into 35,582,335 Keryx Shares, in accordance with the terms of the governing indenture agreement, in exchange for an additional 4,000,000 Keryx Shares, or the Baupost Additional Shares. The aggregate 39.6 million Keryx Shares were then converted into Akebia Shares at the 0.37433 exchange ratio. The fair value of the Baupost Additional Shares, on an as-converted basis, of \$13.4 million has been excluded from the purchase price and recorded within selling, general and administrative expenses in the Company's consolidated financial statements, as the issuance of those shares by Keryx is considered to be a separate transaction under ASC 805, since it was entered into by or on behalf of the acquirer or primarily for the benefit of the acquirer or the combined entity.

The Company allocated the \$527.8 million purchase price to the identifiable assets acquired and liabilities assumed in the business combination at their fair values as of December 12, 2018 as follows (in thousands):

Cash and cash equivalents	\$	5,257
Inventory		235,597
Trade accounts receivable, net		15,834
Prepaid expenses and other current assets		8,399
Goodwill		55,053
Intangible assets:		
Developed product rights for Auryxia		329,130
Other intangible assets		545
Property and equipment, net		3,646
Other assets		14,441
Accounts payable		(17,570)
Accrued expenses		(42,972)
Deferred tax liability		(35,096)
Debt		(15,000)
Fair value of unfavorable executory contract		(29,510)
Total purchase price	\$	<u>527,754</u>

In performing the purchase price allocation, the Company considered, among other factors, the intended future use of acquired assets, analysis of historical financial performance and estimates of future performance of Keryx's business.

As part of the purchase price allocation, the Company identified developed product rights for Auryxia as the primary intangible asset. The fair value of the developed product rights for Auryxia was determined using the multi-period excess earnings method which is a variation of the income approach, and is a valuation technique that provides an estimate of the fair value of an asset based on the principle that the value of an intangible asset is equal to the present value of the incremental after-tax cash flows attributable to the asset, after taking charges for the use of other assets employed by the business. Key estimates and assumptions used in this model were projected revenues and expenses related to the asset, estimated contributory asset charges, and a risk-adjusted discount rate of 20.0% used to calculate the present value of the future expected cash inflows from the asset. The intangible asset is being amortized on a straight-line basis over its estimated useful life, which for Auryxia is nine years.

The Company also identified an executory contract in the supply agreement between Keryx and BioVectra Inc., or BioVectra, which includes future firm purchase commitments. This executory contract was deemed to have an off-market element related to the amount of purchase commitments that exceed the current forecast and as such, the Company recorded a liability in purchase accounting. As of the acquisition date, the fair value of the off-market element was \$29.5 million.

The goodwill represents the excess of the purchase price over the estimated fair value of net assets acquired. The factors contributing to the recognition of goodwill were based on several strategic and synergistic benefits that were expected to be realized from the Merger. These benefits included the expectation that the combined company would establish itself as a leading renal company with enhanced position and large market opportunity, synergistic utilization of Keryx's commercial organization, and strengthening the combined company's financial profile. Such goodwill is not deductible for tax purposes.

In connection with the Merger, the Company identified a deferred tax liability of \$35.1 million as a result of the difference in the book basis and tax basis related to the identifiable inventory, other intangible assets, net and other liability. In determining the deferred tax liability to be recorded the Company elected to first consider the recoverability of the deferred tax assets acquired in the acquisition before considering the recoverability of the acquirer's existing deferred tax assets.

In connection with the Merger, the Company incurred \$23.1 million of direct transaction costs, which along with the expense associated with the Baupost Additional Shares, is recorded within general and administrative expenses in our consolidated financial statements for the year ended December 31, 2018.

6. Available For Sale Securities

Available for sale securities at December 31, 2019 and 2018 consist of the following:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(in thousands)			
December 31, 2019				
Cash and cash equivalents	\$ 147,449	\$ —	\$ —	\$ 147,449
Available for sale securities:				
Certificates of deposit	\$ 245	—	—	\$ 245
Total available for sale securities	\$ 245	\$ —	\$ —	\$ 245
Total cash, cash equivalents, and available for sale securities	\$ 147,694	\$ —	\$ —	\$ 147,694
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(in thousands)			
December 31, 2018				
Cash and cash equivalents	\$ 104,644	\$ —	\$ —	\$ 104,644
Available for sale securities:				
Certificates of deposit	\$ 245	—	—	\$ 245
U.S. government debt securities	158,518	1	(198)	158,321
Corporate debt securities	58,494	—	(64)	58,430
Total available for sale securities	\$ 217,257	\$ 1	\$ (262)	\$ 216,996
Total cash, cash equivalents, and available for sale securities	\$ 321,901	\$ 1	\$ (262)	\$ 321,640

The estimated fair value of the Company's available for sale securities balance at December 31, 2019, by contractual maturity, is as follows (in thousands):

Due in one year or less	\$ 245
Due after one year	—
Total available for sale securities	\$ 245

There were no realized gains or losses on available for sale securities for the years ended December 31, 2019 or 2018. Additionally, the Company did not have any available for sale securities that were in an unrealized loss position as of December 31, 2019. The following table summarizes the Company's available for sale securities that were in a continuous unrealized loss position, but were not deemed to be other-than-temporarily impaired, as of December 31, 2018:

	Unrealized Loss for Less Than 12 Months		Unrealized Loss for 12 Months or More		Total	
	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value
	(in thousands)					
December 31, 2018						
Available for sale securities:						
U.S. government debt securities	\$ (159)	\$ 116,026	\$ (39)	\$ 29,934	\$ (198)	\$ 145,960
Corporate debt securities	(64)	58,430	—	—	(64)	58,430
Total	\$ (223)	\$ 174,456	\$ (39)	\$ 29,934	\$ (262)	\$ 204,390

As noted above, there were no securities as of December 31, 2019 that were in an unrealized loss position. There were 51 securities as of December 31, 2018 that were in an unrealized loss position. The Company considered the decline in the market value of these securities to be primarily attributable to current economic conditions. The contractual terms of these securities do not permit the issuer to settle the securities at a price less than the amortized cost basis of the investment.

7. Fair Value of Financial Instruments

The Company utilizes a portfolio management company for the valuation of the majority of its investments. This company is an independent, third-party vendor recognized to be an industry leader with access to market information that obtains or computes fair market values from quoted market prices, pricing for similar securities, recently executed transactions, cash flow models with yield curves and other pricing models. For valuations obtained from the pricing service, the Company performs due diligence to understand how the valuation was calculated or derived, focusing on the valuation technique used and the nature of the inputs.

Based on the fair value hierarchy, the Company classifies its cash equivalents and available for sale securities within Level 1 or Level 2. This is because the Company values its cash equivalents and available for sale securities using quoted market prices or alternative pricing sources and models utilizing market observable inputs.

Assets measured or disclosed at fair value on a recurring basis as of December 31, 2019 and 2018 are summarized below:

	Fair Value Measurements Using			Total
	Level 1	Level 2	Level 3	
(in thousands)				
December 31, 2019				
Assets:				
Cash and cash equivalents	\$ 147,449	\$ —	\$ —	\$ 147,449
Certificates of deposit	—	245	—	245
	<u>\$ 147,449</u>	<u>\$ 245</u>	<u>\$ —</u>	<u>\$ 147,694</u>
Liabilities:				
Derivative liability	\$ —	\$ —	\$ 1,650	\$ 1,650
	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 1,650</u>	<u>\$ 1,650</u>
	Fair Value Measurements Using			Total
	Level 1	Level 2	Level 3	
(in thousands)				
December 31, 2018				
Assets:				
Cash and cash equivalents	\$ 104,644	\$ —	\$ —	\$ 104,644
Certificates of deposit	—	245	—	245
U.S. government debt securities	—	158,321	—	158,321
Corporate debt securities	—	58,430	—	58,430
	<u>\$ 104,644</u>	<u>\$ 216,996</u>	<u>\$ —</u>	<u>\$ 321,640</u>

The corporate debt securities held by the Company were all investment grade.

The Company's Loan Agreement with Pharmakon (see Note 11) contains certain provisions that change the underlying cash flows of the debt instrument, including a potential extension to the interest-only period dependent on both no event of default having occurred and continuing and on the Company achieving certain regulatory and revenue conditions. The Company also assessed the acceleration of the obligations under the Loan Agreement under an event of default. In addition, under certain circumstances, a default interest rate will apply on all outstanding obligations during the occurrence and continuance of an event of default. In accordance with ASC 815, the Company concluded that these features are not clearly and closely related to the host instrument, and represent a single compound derivative that is required to be re-measured at fair value on a quarterly basis.

The events of default include a minimum liquidity threshold starting in 2021. At November 25, 2019, the Company recorded a derivative liability related to the Company's Loan Agreement with Pharmakon of \$1.7 million. The Company determined that the change in fair value from November 25, 2019 to December 31, 2019 was immaterial. The Company classified the derivative liability as a non-current liability on the balance sheet at December 31, 2019. The estimated fair value of the derivative liability was determined using a scenario-based approach and discounted cash flow model that includes principal and interest payments under various scenarios involving clinical development success for vadadustat and various cash flow assumptions. Probabilities surrounding clinical development success were derived using industry benchmarks. Should the Company's assessment of the probabilities around these scenarios change, there could be a change to the fair value of the derivative liability.

The Company had no other assets or liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) at December 31, 2019 and December 31, 2018.

Investment securities are exposed to various risks such as interest rate, market and credit risks. Due to the immaterial balance of investments held at December 31, 2019, the Company does not believe that changes in risks in the near term would result in material changes in the fair value of investments.

8. Inventory

The components of inventory, inclusive of step-up as a result of bringing Keryx's inventory onto Akebia's books in connection with the Merger, are summarized as follows:

	December 31, 2019	December 31, 2018
	(in thousands)	
Raw materials	\$ 2,278	\$ 1,880
Work in process	137,858	215,122
Finished goods	42,096	18,182
Total inventory	<u>\$ 182,232</u>	<u>\$ 235,184</u>

Long-term inventory, which primarily consists of raw materials and work in process, is included in other assets in the Company's consolidated balance sheets.

	December 31, 2019	December 31, 2018
	(in thousands)	
Balance Sheet Classification:		
Inventory	\$ 116,349	\$ 114,245
Other assets	65,883	120,939
Total inventory	<u>\$ 182,232</u>	<u>\$ 235,184</u>

Inventory amounts written down as a result of excess, obsolescence, scrap or other reasons and charged to cost of goods sold totaled \$7.1 million during the year ended December 31, 2019. There were no inventory write-offs during the period from December 12, 2018 through December 31, 2018. If future sales of Auryxia are lower than expected, the Company may be required to write-down the value of such inventories. Inventory write-downs and losses on purchase commitments are recorded as a component of cost of sales in the consolidated statement of operations.

9. Intangible Assets and Goodwill

Intangible Assets

The following table presents the Company's intangible assets (in thousands):

	December 31, 2019				Estimated useful life
	Gross Carrying Value	Accumulated Amortization	ASC 842 Adjustment	Total	
Acquired intangible assets:					
Developed product rights for Auryxia	\$ 329,130	\$ (37,918)	\$ —	\$ 291,212	9 Years
Favorable lease	545	(5)	(540)	-	N/A
Total	\$ 329,675	\$ (37,923)	\$ (540)	\$ 291,212	

	December 31, 2018				Estimated useful life
	Gross Carrying Value	Accumulated Amortization	Total	Total	
Acquired intangible assets:					
Developed product rights for Auryxia	\$ 329,130	\$ (1,517)	\$ 327,613		9 Years
Favorable lease	545	(5)	540		4 years
Total	\$ 329,675	\$ (1,522)	\$ 328,153		

On December 12, 2018, the Company completed the Merger, whereby it acquired certain definite-lived intangible assets, including the developed product rights for Auryxia and a favorable lease. The Company amortizes its definite-lived intangible assets acquired as part of the Merger using the straight-line method, which is considered the best estimate of economic benefit, over its estimated useful life. As a result of the adoption of ASC 842 on January 1, 2019, the Company reclassified the remaining balance of the favorable lease intangible asset into the operating lease asset. The Company recorded \$36.4 million and \$1.5 million in amortization expense related to the developed product rights for Auryxia during the years ended December 31, 2019 and 2018. Estimated future amortization expense for the intangible asset as of December 31, 2019 is as follows (in thousands):

	Total
2020	\$ 36,402
2021	36,401
2022	36,402
2023	36,401
2024	36,402
Thereafter	109,204
	<u>\$ 291,212</u>

Goodwill

Goodwill was \$55.1 million as of December 31, 2019 and 2018, derived as follows (in thousands):

Total Merger consideration	\$ 527,754
Less: Fair value of identified acquired assets and liabilities, net	(472,701)
Goodwill	<u>\$ 55,053</u>

Goodwill is evaluated for impairment on an annual basis as of October 1, and more frequently if indicators are present or changes in circumstances suggest that an impairment may exist.

10. Accrued Expenses

Accrued expenses are as follows:

	December 31, 2019	December 31, 2018
	(in thousands)	
Accrued clinical	\$ 61,815	\$ 71,881
Product revenue allowances	30,552	22,861
Accrued payroll	12,604	12,880
Lease liability	4,989	—
Professional fees	3,444	2,367
Royalties	2,713	2,430
Accrued commercial manufacturing	2,680	6,383
Accrued severance	725	3,962
Merger costs	—	16,071
Accrued other	9,549	12,082
Total accrued expenses	<u>\$ 129,071</u>	<u>\$ 150,917</u>

11. Debt

Future principal payments on the Term Loans (as defined below) as of December 31, 2019 are as follows (in thousands):

	Principal Payments (in thousands)
2020	\$ —
2021	—
2022	7,140
2023	30,354
2024	42,506
Thereafter	—
Total before unamortized discount and issuance costs	80,000
Less: unamortized discount and issuance costs	(4,195)
Total term loans	<u>\$ 75,805</u>

Term Loans

On November 11, 2019, the Company, with Keryx as guarantor, entered into a loan agreement, or the Loan Agreement, with BioPharma Credit PLC as collateral agent and a lender, or the Collateral Agent, and BioPharma Credit Investments V (Master) LP as a lender, collectively with the Collateral Agent, Pharmakon, pursuant to which term loans in an aggregate principal amount of \$100.0 million are made available to the Company in two tranches, subject to certain terms and conditions, or the Term Loans. The first tranche of \$80.0 million, or Tranche A, was drawn on November 25, 2019, or the Tranche A Funding Date. The second tranche, available until December 31, 2020, allows the Company to borrow, at its option, an additional \$20.0 million, or Tranche B, subject to the satisfaction of customary conditions. The date on which Tranche B is drawn, the Tranche B Funding Date, and each of the Tranche A Funding Date and the Tranche B Funding Date, a Funding Date.

Proceeds from the Term Loans may be used for general corporate purposes. The Company and Keryx entered into a Guaranty and Security Agreement with the Collateral Agent, or the Guaranty and Security Agreement, on the Tranche A Funding Date. Pursuant to the Guaranty and Security Agreement, the Company's obligations under the Term Loans are unconditionally guaranteed by Keryx, or the Guarantee. Additionally, the obligations of the Company and Keryx under the Term Loans and the Guarantee are secured by a first priority lien on certain assets of the Company and Keryx, including Auryxia and certain related assets, cash, and certain equity interests held by the Company and Keryx, collectively the Collateral.

The Term Loans bear interest at a floating rate per annum equal to the three-month LIBOR rate plus 7.50%, subject to a 2.00% LIBOR floor and a 3.35% LIBOR cap, payable quarterly in arrears. The Term Loans will mature on the fifth anniversary of the Tranche A Funding Date, or the Maturity Date. The Company will repay the principal under the Term Loans in equal quarterly payments starting on the 33rd-month anniversary of the applicable Funding Date or, if certain conditions are met, it will have the option to repay the principal in equal quarterly payments starting on the 48th-month anniversary of the applicable Funding Date, or collectively the Amortization Schedule. Under certain circumstances, unless certain liquidity conditions are met, the Maturity Date may decrease by up to one year, and the Amortization Schedule may correspondingly commence up to one year earlier.

On the Tranche A Funding Date, the Company paid to Pharmakon a facility fee equal to 2.00% of the aggregate principal amount of the Term Loans, or \$2.0 million, in addition to other expenses incurred by Pharmakon and reimbursed by the Company, or Lender Expenses. The Tranche A draw was \$77.3 million, net of facility fee, Lender Expenses and issuance costs. The Loan Agreement permits voluntary prepayment at any time in whole or in part, subject to a prepayment premium. The prepayment premium would be 2.00% of the principal amount being prepaid prior to the third anniversary of the applicable Funding Date, 1.00% on or after the third anniversary, but prior to the fourth anniversary, of the applicable Funding Date, and 0.50% on or after the fourth anniversary of the applicable Funding Date but prior to the Maturity Date, and a make-whole premium on or prior to the second anniversary of the applicable Funding Date in an amount equal to foregone interest through the second anniversary of the applicable Funding Date. A change of control triggers a mandatory prepayment of the Term Loans.

The Loan Agreement contains customary representations, warranties, events of default and covenants of the Company and its subsidiaries, including maintaining, on an annual basis, a minimum liquidity threshold starting in 2021, and on a quarterly basis, a minimum net sales threshold for Auryxia starting in the fourth quarter of 2020. If an event of default occurs and is continuing under the Loan Agreement, the Collateral Agent is entitled to take enforcement action, including acceleration of amounts due under the Loan Agreement. Under certain circumstances, a default interest rate will apply on all outstanding obligations during the occurrence and continuance of an event of default. As of December 31, 2019, the Company determined that no events of default had occurred.

The Company assessed the terms and features of the Loan Agreement in order to identify any potential embedded features that would require bifurcation or any beneficial conversion feature. As part of this analysis, the Company assessed the economic characteristics and risks of the Loan Agreement, including put and call features. The terms and features assessed include a potential extension to the interest-only period dependent on both no event of default having occurred and continuing and on the Company achieving certain regulatory and revenue conditions. The Company also assessed the acceleration of the obligations under the Loan Agreement under an event of default. In addition, under certain circumstances, a default interest rate will apply on all outstanding obligations during the occurrence and continuance of an event of default. In accordance with ASC 815, the Company concluded that these features are not clearly and closely related to the host instrument, and represent a single compound derivative that is required to be re-measured at fair value on a quarterly basis.

The events of default include a minimum liquidity threshold starting in 2021. At November 25, 2019, the Company recorded a derivative liability related to the Company's Loan Agreement with Pharmakon of \$1.7 million. The Company determined that the change in fair value from November 25, 2019 to December 31, 2019 was immaterial. The Company classified the derivative liability as a non-current liability on the balance sheet at December 31, 2019.

During the year ended December 31, 2019, the Company recognized approximately \$0.9 million of interest expense related to the Loan Agreement.

Revolving Line of Credit

Keryx, the Company's wholly owned subsidiary following the Merger, had a \$40.0 million revolving line of credit, or the Line of Credit, under its Loan and Security Agreement with Silicon Valley Bank, or SVB. On July 31, 2019, Keryx entered into a Waiver and First Amendment to Loan and Security Agreement, or the Loan Amendment. Pursuant to the Loan Amendment, certain revisions were made to the Loan and Security Agreement, including requiring Keryx to maintain, from and after December 31, 2019, subject to certain exceptions, a certain amount of funds to which the Company had unrestricted access in one or more asset management accounts with SVB or SVB's affiliate and revising certain of the representations and warranties and covenants in the Loan and Security Agreement. In addition, pursuant to the Loan Amendment, SVB waived the then-existing events of default.

On August 7, 2019, the Company executed and delivered to SVB an Unconditional Guaranty, or the Guaranty, pursuant to which the Company guaranteed the prompt and complete payment and performance when due of all of the obligations and liabilities of Keryx under the Loan and Security Agreement, as amended by the Loan Amendment, or the Amended Loan Agreement. In addition, the Company entered into a Security Agreement with SVB effective August 7, 2019, or the Security Agreement, pursuant to which the Company granted to SVB a continuing first priority security interest in substantially all of the Company's personal property, other than the Company's intellectual property, to secure the payment and performance of the Company's obligations under the Guaranty. The Company's obligations under the Guaranty were independent of Keryx's obligations, and separate actions were able to be brought against the Company.

Availability under the Line of Credit was subject to a borrowing base comprised of eligible receivables and eligible inventory of Keryx as set forth in the Loan and Security Agreement. As of December 31, 2019 and 2018, there was \$0 and \$15.0 million outstanding, respectively, under the Line of Credit and the Company had \$0 in available borrowing base as of December 31, 2019, as the Line of Credit was terminated in November 2019.

The principal amount outstanding under the Loan and Security Agreement bore interest at a floating rate per annum equal to the greater of (i) 2.0% above the "prime rate," as reported in The Wall Street Journal and (ii) 6.75%, which interest was payable monthly. Principal amounts borrowed under the Line of Credit were able to be repaid and, prior to the maturity date, re-borrowed, subject to the terms and conditions set forth in the Loan and Security Agreement. Upon entry into the Loan and Security Agreement (payable in installments and subject to certain conditions), and at the one year anniversary of the effective date of the Loan and Security Agreement (or, if earlier, upon termination of or an event of default under the Loan and Security Agreement), Keryx paid to SVB a fee equal to 1.00% of the Line of Credit. Keryx was also required to pay on a quarterly basis a fee equal to 0.25% per annum of the average unused portion of the Line of Credit. Pursuant to the terms of the Loan and Security Agreement, Keryx was required to pay a termination fee of 2.00% of the Line of Credit, if the Loan and Security Agreement was terminated prior to the maturity date, subject to certain exceptions. The Company terminated the Loan and Security Agreement, the Unconditional Guaranty, and the Security Agreement on November 7, 2019, and Keryx paid SVB a termination fee of \$0.8 million.

During the year ended December 31, 2019 and the period from December 12, 2018 through December 31, 2018, the Company recognized approximately \$0.5 million and \$65,000, respectively, of interest expense related to the Line of Credit. The Company did not incur any amortization expense related to the origination fee and other additional fees noted above as such fees were included in the fair value of the Line of Credit as of December 12, 2018, the date on which the Merger was consummated, in accordance with ASC 805.

12. Warrant

In connection with the Janssen Agreement, in February 2017, the Company issued a warrant to purchase 509,611 shares of the Company's common stock at an exercise price of \$9.81 per share. The warrant was fully vested upon issuance and exercisable in whole or in part, at any time prior to February 9, 2022. The warrant satisfied the equity classification criteria of ASC 815, and is therefore classified as an equity instrument. The fair value at issuance of \$3.4 million was calculated using the Black-Scholes option pricing model and was charged to research and development expense as it represented consideration for a license for which the underlying intellectual property was deemed to have no alternative future use. As of December 31, 2019, the warrant remains outstanding and expires on February 9, 2022.

13. Stockholders' Equity

Authorized and Outstanding Capital Stock

As of December 31, 2019, the authorized capital stock of the Company included 175,000,000 shares of common stock, par value \$0.00001 per share, of which 121,674,568 and 116,887,518 shares were issued and outstanding at December 31, 2019 and 2018, respectively; and 25,000,000 shares of undesignated preferred stock, par value \$0.00001 per share, of which 0 shares were issued and outstanding at December 31, 2019 and December 31, 2018.

Retired Shares

In April 2019, the Company repurchased and retired 55,324 shares of common stock from certain officers of the Company. The proceeds from the disposition of these shares were used by certain officers of the Company to cover tax liabilities associated with previously vested RSUs.

At-the-Market Facility

In May 2016, the Company established an at-the-market, or ATM, equity offering program pursuant to which it was able to offer and sell up to \$75.0 million its common stock at the then current market prices from time to time. Through December 31, 2018, the Company sold 1,775,214 shares of common stock under this program with net proceeds of \$22.6 million, of which 694,306 shares were sold in the year ended December 31, 2018 for net proceeds of approximately \$10.5 million. Additionally, the Company sold 1,384,520 shares in the six months ended June 30, 2019 for net proceeds (after deducting commissions and other offering expenses) of approximately \$9.4 million.

On November 12, 2019, the Company entered into an Amended and Restated Controlled Equity OfferingSM Sales Agreement with Cantor Fitzgerald & Co. for the offer and sale of common stock at the then current market prices in amounts to be determined from time to time. Also, on November 12, 2019, the Company filed a prospectus supplement pursuant to which it was able to offer and sell up to \$75.0 million its common stock at the then current market prices from time to time. In December 2019, the Company commenced sales under this program. Through December 31, 2019, the Company sold 2,684,392 shares of common stock under this program with net proceeds (after deducting commissions and other offering expenses) of \$16.8 million. Subsequent to December 31, 2019 and through February 4, 2020, the Company sold 7,973,967 shares of common stock under this program with net proceeds (after deducting commissions and other offering expenses) of \$56.7 million.

Equity Offering

In March 2018, the Company completed a follow-on public equity offering, whereby the Company sold 8,500,000 shares of common stock at a public offering price of \$10.50 per share. The aggregate net proceeds received by the Company from the offering were approximately \$84.8 million, net of underwriting discounts and commissions and estimated offering expenses payable by the Company. The Company did not have any follow-on public equity offerings during the year ended December 31, 2019.

Shares Issued and Awards Assumed in Connection with Business Combination

On December 12, 2018, the Company completed the Merger. Pursuant to the terms and conditions of the Merger Agreement, each Keryx Share issued and outstanding as of the Effective Time was cancelled and converted into 0.37433 fully paid and non-assessable Akebia Shares. As a result, in December 2018, the Company issued 57,773,090 shares of common stock to Keryx shareholders, and 1,497,320 shares issued as part of the Baupost Additional Shares which has been excluded from the business combination purchase price (see Note 5).

Additionally, in connection with the Merger, the Company converted outstanding and unexercised options to purchase Keryx Shares into 3,967,290 options to purchase Akebia Shares, as adjusted to reflect the Exchange Multiplier, of which 3,733,336 are service-based stock options and 233,954 are performance-based stock options. The Company also converted outstanding Keryx Restricted Shares into 602,752 Akebia RSUs, of which 486,709 are service-based RSUs and 116,043 are performance-based RSUs.

Acceleration of Equity Awards

In connection with the closing of the Merger, certain executives of Keryx were terminated and as a result, the Company accelerated in full the vesting of all of the outstanding equity awards for each such executive, consistent with his or her existing employment agreements. Additionally, subject to limited exceptions, all outstanding equity awards held by certain officers of Akebia also had the vesting of their outstanding equity awards accelerated in full upon consummation of the Merger as a result of the change in control provision included in each such officer's award agreements and their Executive Severance Agreements. As a result, the Company recognized \$9.7 million of stock-based compensation expense related to the acceleration of awards during the year ended December 31, 2018.

Equity Plans

On February 28, 2014, the Company's Board of Directors adopted its 2014 Incentive Plan and its 2014 Employee Stock Purchase Plan, or the 2014 ESPP, which were subsequently approved by its shareholders and became effective upon the closing of the Company's initial public offering on March 25, 2014. The Company's 2014 Incentive Plan was subsequently amended on December 11, 2018, which amendment did not require shareholder approval. The Company's 2014 Incentive Plan, as amended, is referred to as the 2014 Plan. The 2014 Plan replaced the Company's Amended and Restated 2008 Equity Incentive Plan, or the 2008 Plan; however, options or other awards granted under the 2008 Plan prior to the adoption of the 2014 Plan that have not been settled or forfeited remain outstanding and effective. On June 6, 2019, the Company's shareholders approved the Amended and Restated 2014 Employee Stock Purchase Plan, or the ESPP. In May 2016, the Company's Board of Directors approved an inducement award program that was separate from the Company's equity plans and which, consistent with Nasdaq Listing Rule 5635(c)(4), did not require shareholder approval, or the Inducement Award Program. For 2019, the Company authorized the issuance of up to 3,150,000 shares for the purpose of granting options to purchase shares of the Company's common stock to new hires under the Inducement Award Program, of which 1,505,300 options to purchase Akebia Shares were granted during the year ended December 31, 2019, of which 1,412,550 options to purchase Akebia Shares remained outstanding at December 31, 2019.

The 2014 Plan allows for the granting of stock options, stock appreciation rights, or SARs, restricted stock, unrestricted stock, RSUs, performance awards and other awards convertible into or otherwise based on shares of the Company's common stock. Dividend equivalents may also be provided in connection with an award under the 2014 Plan. The Company's employees, officers, directors and consultants and advisors are eligible to receive awards under the 2014 Plan. The Company initially reserved 1,785,000 shares of its common stock for the issuance of awards under the 2014 Plan. The 2014 Plan provides that the number of shares reserved and available for issuance under the 2014 Plan will automatically increase annually on January 1 of each calendar year, by an amount equal to three percent (3%) of the number of Akebia Shares outstanding on a fully diluted basis as of the close of business on the immediately preceding December 31, or the 2014 Plan Evergreen Provision. The Company's Board of Directors may act prior to January 1 of any year to provide that there will be no automatic increase in the number of Akebia Shares available for grant under the 2014 Plan for that year (or that the increase will be less than the amount that would otherwise have automatically been made). On December 12, 2018, in connection with the consummation of the Merger, the Company assumed outstanding and unexercised options to purchase Keryx Shares, as adjusted by the Exchange Multiplier pursuant to the terms of the Merger Agreement, under the following Keryx equity plans, or the Keryx Equity Plans: the Keryx 1999 Share Option Plan, the Keryx 2004 Long-Term Incentive Plan, the Keryx 2007 Incentive Plan, the Keryx Amended and Restated 2013 Incentive Plan, and the Keryx 2018 Equity Incentive Plan, or the Keryx 2018 Plan. In addition, the number of Keryx Shares available for issuance under the Keryx 2018 Plan, as adjusted by the Exchange Multiplier pursuant to the terms of the Merger Agreement, may be used for awards granted by the Company under its 2014 Plan, or the Assumed Shares, provided that the Company uses the Assumed Shares for individuals who were not employees or directors of the Company prior to the consummation of the Merger. During the year ended December 31, 2019, the Company granted 2,028,625 options to purchase Akebia Shares to employees under the 2014 Plan, 1,505,300 options to purchase Akebia Shares to employees under the Inducement Award Program, 4,485,895 Akebia RSUs to employees under the 2014 Plan, 180,900 options to purchase Akebia Shares to directors under the 2014 Plan, and 123,300 Akebia RSUs to directors under the 2014 Plan.

The ESPP provides for the issuance of options to purchase shares of the Company's common stock to participating employees at a discount to their fair market value. As noted above, the Company's stockholders approved the ESPP, which amended and restated the Company's 2014 ESPP, on June 6, 2019. The maximum aggregate number of shares at December 31, 2019 of the Company's common stock available for future issuance under the ESPP is 5,715,992. Under the ESPP, each offering period is six months, at the end of which employees may purchase shares of the Company's common stock through payroll deductions made over the term of the offering. The per-share purchase price at the end of each offering period is equal to the lesser of eighty-five percent (85%) of the closing price of the Company's common stock at the beginning or end of the offering period.

Shares Reserved for Future Issuance

The Company has reserved for future issuance the following number of shares of common stock:

	<u>December 31, 2019</u>	<u>December 31, 2018</u>
Common stock options and RSUs outstanding (1)	12,195,031	9,309,204
Shares available for issuance under Akebia equity plans (2)	2,983,256	4,526,563
Warrant to purchase common stock	509,611	509,611
Shares available for issuance under the ESPP (3)	5,715,992	603,522
Total	<u>21,403,890</u>	<u>14,948,900</u>

(1) Includes awards granted under the 2014 Plan and the Inducement Award Program and awards issued in connection with the Merger.

(2) On January 1, 2020, January 1, 2019 and January 1, 2018, the shares reserved for future grants under the 2014 Plan increased by 4,031,376, 3,801,198 and 1,575,329 shares, respectively, pursuant to the 2014 Plan Evergreen Provision. On December 12, 2018, the shares reserved for future grants under the 2014 Plan increased by 2,323,213 shares as a result of the Company's addition of the Assumed Shares to the 2014 Plan. On December 19, 2017, the Company's Board of Directors approved 750,000 shares for issuance as option awards in fiscal year 2018 under the Inducement Award Program. On January 30, 2019, the Company's Board of Directors approved 3,150,000 shares for issuance as option awards in fiscal year 2019 under the Inducement Award Program.

(3) On June 6, 2019, the shares reserved for future issuance under the ESPP increased by 5,200,000 shares upon shareholder approval of the Amended and Restated 2014 Employee Stock Purchase Plan. On February 28, 2018 and February 28, 2017, the shares reserved for future issuance under the ESPP remained unchanged. There were no increases in the shares reserved for future issuance pursuant to the evergreen provision under the 2014 ESPP in 2017 and 2018 as the maximum aggregate number of shares available for purchase under the 2014 ESPP had reached its cap of 739,611 on February 28, 2016.

Stock-Based Compensation

Stock Options

Service-Based Stock Options

On February 28, 2019, as part of the Company's annual grant of equity, the Company issued 2,028,625 stock options to employees. In addition, the Company issues stock options to directors, new hires and occasionally to other employees not in connection with the annual grant process. Options granted by the Company vest over periods of between 12 and 48 months, subject, in each case, to the individual's continued service through the applicable vesting date. Options vest either 100% on the first anniversary of the grant date or in installments of (i) 25% at the one year anniversary and (ii) 12 equal quarterly installments beginning after the one year anniversary of the grant date, subject to the individual's continuous service with the Company. Options generally expire ten years after the date of grant. The Company recorded approximately \$5.4 million, \$11.9 million and \$6.5 million of stock-based compensation expense related to stock options granted during fiscal years 2019, 2018 and 2017, respectively.

On December 12, 2018, pursuant to the Merger Agreement, each outstanding and unexercised option to acquire Keryx Shares granted under a Keryx equity plan converted into an option to acquire Akebia Shares, with the number of shares and exercise price adjusted by the Exchange Multiplier. As a result, the Company assumed 3,733,336 service-based options related to the Merger. The vesting schedule for these options is consistent with the vesting schedule noted above.

The assumptions used in the Black-Scholes pricing model to estimate the grant date fair value of options granted under the 2014 Plan are as follows:

	Year ended December 31,		
	2019	2018	2017
Risk-free interest rate	1.42% - 2.57%	2.54% - 3.01%	1.81% - 2.27%
Dividend yield	0.00%	0.00%	0.00%
Volatility	61.40% - 64.10%	61.65% - 77.04%	78.57% - 85.81%
Expected term (years)	5.51 - 6.25	5.51 - 6.25	5.51 - 6.25

The following table summarizes the Company's stock option activity, excluding performance-based options, for the year ended December 31, 2019:

	Shares	Weighted-Average Exercise Price	Weighted-Average Contractual Life (in years)	Aggregate Intrinsic Value
Outstanding, December 31, 2018	8,144,752	\$ 13.57		\$ 2,351,316
Granted	3,714,825	\$ 6.38		
Exercised	(362,796)	\$ 1.54		\$ 1,273,757
Forfeited	(3,842,588)	\$ 15.26		\$ 67,753
Expired/cancelled	(30,084)	\$ 18.09		
Outstanding, December 31, 2019	7,624,109	\$ 9.77	7.84	\$ 3,173,101
Options exercisable, December 31, 2019	3,759,075	\$ 12.74	6.45	\$ 983,273
Vested and expected to vest, December 31, 2019	7,624,109	\$ 9.77		

The weighted-average grant date fair values of options granted in the years ended December 31, 2019, 2018, and 2017 were \$3.85, \$7.12, and \$8.47 per share, respectively. The total intrinsic value of options exercised during the years ended December 31, 2019, 2018, and 2017 were \$1.3 million, \$1.2 million, and \$2.7 million, respectively. The fair value of options that vested during the years ended December 31, 2019, 2018, and 2017 were \$4.3 million, \$13.6 million, and \$5.6 million, respectively. As of December 31, 2019, there was approximately \$13.5 million of unrecognized compensation cost related to stock options under the Company's 2014 Plan or made pursuant to the Inducement Award Program, which is expected to be recognized over a weighted average period of 2.83 years.

Performance-Based Stock Options

On December 12, 2018, pursuant to the Merger Agreement, each outstanding and unexercised performance-based option to acquire Keryx Shares granted under a Keryx equity plan converted into a service-based option or performance-based option to acquire Akebia Shares, with the number of shares and exercise price adjusted by the Exchange Multiplier. As a result, the Company issued 233,954 performance-based options related to the Merger. The Company did not have any performance based-options outstanding in fiscal year 2018 prior to the Merger. The Company did not issue any performance-based options during the year ended December 31, 2019 and 2018 besides those issued related to the Merger in 2018. As of December 31, 2019, the Company had 46,790 performance-based options outstanding. The potential range of shares issuable pursuant to the Company's performance-based options range from 0% to 100% of the target shares based on financial measures. Performance-based options vest up to 50% upon achievement of performance condition and up to 50% one year following achievement of the performance condition.

The following table summarizes the Company's performance-based option activity for the year ended December 31, 2019:

	Shares	Weighted-Average Exercise Price	Weighted-Average Contractual Life (in years)	Aggregate Intrinsic Value
Outstanding, December 31, 2018	202,136	\$ 19.82	7.42	\$ —
Granted	—	\$ —		
Exercised	—	\$ —		\$ —
Forfeited/cancelled	(155,346)	\$ 21.04		
Outstanding, December 31, 2019	<u>46,790</u>	\$ 15.77	6.83	\$ —

The Company did not record any stock-based compensation expense related to performance-based options during 2019, 2018 and 2017. There were 46,790 performance-based options that vested during fiscal year 2019 and no performance-based options that vested during fiscal years 2018 or 2017. As of December 31, 2019, there were no unrecognized compensation costs related to performance-based stock options under the Company's 2014 Plan.

Restricted Stock Units

On February 28, 2019, as part of the Company's annual grant of equity, the Company issued 1,384,775 restricted stock units, or RSUs, to employees. In addition, the Company occasionally issues RSUs not in connection with the annual grant process to employees. On September 30, 2019, the Company issued 2,979,400 restricted stock units to employees. RSUs granted by the Company vest in one of the following ways: (i) 100% of each RSU grant vests on either the first or the third anniversary of the grant date, or (ii) one third of each RSU grant vests on the first, second and third anniversaries of the grant date, subject, in each case, to the individual's continued service through the applicable vesting date, or (iii) 50% of each RSU grant vests on the first anniversary and 25% of each RSU grant vests in 6 months increment after the one year anniversary of the grant date. The expense recognized for these awards is based on the grant date fair value of the Company's common stock multiplied by the number of units granted and recognized on a straight-line basis over the vesting period. The Company recorded approximately \$6.2 million, \$5.8 million and \$2.0 million of stock-based compensation expense related to employee RSUs in 2019, 2018 and 2017, respectively.

On December 12, 2018, pursuant to the Merger Agreement, each Keryx Share that was subject to a Keryx restricted share award, other than those Keryx restricted shares that accelerated or lapsed as a result of the completion of the Merger, was converted into an RSU award of Akebia, covering the number of Akebia Shares determined in accordance with the Exchange Multiplier. As a result, the Company issued 486,709 service-based RSUs in substitution for Keryx restricted share awards in connection with the Merger. These RSUs vest either (i) in 3 equal annual installments beginning after the one-year anniversary of the grant date or (ii) one third on the one year anniversary of the grant date with the remaining RSUs vesting on the first day of each calendar quarter over the next two years thereafter.

A following table summarizes the Company's RSU activity for the year ended December 31, 2019:

	Shares	Weighted- Average Grant Date Fair Value
Unvested balance, December 31, 2018	846,273	\$ 9.16
Granted	4,609,195	\$ 4.97
Vested	(323,136)	\$ 8.32
Forfeited	(621,302)	\$ 6.90
Unvested balance, December 31, 2019	<u>4,511,030</u>	\$ 5.25

The total amount of RSUs that vested during 2019, 2018 and 2017 (measured on the date of vesting) was \$2.7 million, \$7.4 million, and \$0.2 million, respectively. As of December 31, 2019, there was approximately \$17.8 million of unrecognized compensation cost related to RSUs, which is expected to be recognized over a weighted average period of 1.82 years.

There are 13,102 performance-based RSUs, issued in connection with the Merger, outstanding at December 31, 2019.

Employee Stock Purchase Plan

The first offering period under the ESPP opened on January 2, 2015. The Company issued 87,530 shares during the year ended December 31, 2019. The Company recorded approximately \$0.3 million, \$0.2 million and \$0.2 million of stock-based compensation expense related to the ESPP during 2019, 2018 and 2017, respectively.

Compensation Expense Summary

The Company has classified its stock-based compensation expense related to share-based awards as follows:

	Years ended December 31,		
	2019	2018	2017
	(in thousands)		
Research and development	\$ 3,544	\$ 5,755	\$ 6,496
Selling, general and administrative	8,381	13,285	5,784
Total	\$ 11,925	\$ 19,040	\$ 12,280

Compensation expense by type of award:

	Years ended December 31,		
	2019	2018	2017
	(in thousands)		
Stock options	\$ 5,421	\$ 12,114	\$ 6,512
Restricted stock	—	—	158
Restricted stock units	6,240	6,731	2,021
Employee stock purchase plan	264	195	176
Warrant	—	—	3,413
Total	\$ 11,925	\$ 19,040	\$ 12,280

Included in the compensation expense of stock options and RSUs for the year ended December 31, 2018, is approximately \$1.1 million related to awards assumed under the Merger and acceleration of the vesting for awards of certain officers of Keryx.

14. Income Taxes

The Company's income tax provision was computed based on the federal statutory rate and the state statutory rates, net of the related federal benefit. There was no current or deferred income tax expense or benefit for the year ended December 31, 2017 due to the Company's net losses and increases in its valuation allowance against its deferred tax assets. At December 31, 2018 the Company recorded a tax benefit of \$28.3 million as a result of the Merger with Keryx. As part of purchase accounting, the Company recorded a deferred tax liability that is a source of income for which the Company can benefit from its tax attributes. The use of the Company's tax attributes resulted in a release of the corresponding valuation allowance associated with this benefit. At December 31, 2019 the company has recorded an additional tax benefit of \$6.6 million as a result of additional losses incurred during the year.

The provision for income taxes for each of the years ended December 31, 2019, 2018 and 2017 consisted of the following:

	Year ended December 31,		
	2019	2018	2017
Current:			
Federal	—	23	—
State	—	104	—
Foreign	—	—	—
Total Current:	—	127	—
Deferred:			
Federal	—	(16,383)	—
State	(6,631)	(12,082)	—
Foreign	—	—	—
Total Deferred:	(6,631)	(28,465)	—
Total Income Taxes	(6,631)	(28,338)	—

Our effective income tax rate differs from the statutory federal income tax rate as follows for the years ended December 31, 2019, 2018 and 2017:

	Year ended December 31,		
	2019	2018	2017
Federal tax at statutory rate	21.0%	21.0%	34.0%
State and local tax at statutory rate	5.5	4.1	3.8
Research and development tax credits	2.0	5.0	11.9
Equity compensation	—	—	(0.6)
Alternative minimum tax	—	—	(1.3)
Change in valuation allowance	(22.4)	16.3	6.9
Impact of US tax reform	—	—	(54.7)
Non-deductible transaction costs	—	(3.1)	—
Other permanent differences	(0.3)	(0.7)	—
Reduction in deferred tax assets for change in ownership	(1.6)	(26.1)	—
Effect of rate changes	(1.4)	—	—
Other	(0.5)	—	—
Effective tax rate	2.3%	16.5%	0.0%

For the year ended December 31, 2017, the Company had taxable income primarily due to timing differences. The income was fully offset with available net operating losses, or NOLs, for regular federal and state tax purposes. The Company did have a tax liability that was based on the Alternative Minimum Tax and resulted in approximately \$0.8 million of Federal Tax, however due to tax reform, the amount is fully refundable through 2021 and thus the net result is that the Company recorded an income tax receivable of approximately \$0.8 million rather than a tax expense for the year ended December 31, 2017.

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. When realization of the deferred tax asset is more likely than not to occur, the benefit related to the deductible temporary differences attributable to operations is recognized as a reduction of income tax expense. A valuation allowance is recorded against deferred tax assets if it is more likely than not that some or all of the deferred tax assets will not be realized. The Company cannot be certain that future taxable income will be sufficient to realize its deferred tax assets. Accordingly, the Company has recorded a valuation allowance against the Company's otherwise recognizable net deferred tax assets. The Company continues to maintain the underlying tax benefits to offset future taxable income and to monitor the need for a valuation allowance based on the profitability of its future operations. The valuation allowance increased by approximately \$64.0 million and \$23.3 million, during the years ended December 31, 2019 and 2018, respectively. Significant components of the Company's deferred tax assets and liabilities are as follows:

	December 31,	
	2019	2018
(in thousands)		
Deferred tax assets:		
Accrued expenses	\$ 2,933	\$ 4,993
Deferred revenue	18,678	28,533
Stock based compensation	10,136	9,514
Research and development credits	9,601	2,899
Other non-current liabilities	8,049	7,567
Net operating loss carryforward	242,167	189,842
ASC 842 lease liability	8,382	—
Fixed assets	806	—
Other	4,018	853
Total deferred tax assets	304,770	244,201
Less valuation allowance	(195,418)	(131,424)
Total deferred tax assets, net of valuation allowance	109,352	112,777
Deferred tax liabilities:		
Fixed assets	—	(121)
Intangible assets	(75,940)	(81,847)
Inventory	(25,494)	(37,440)
ASC 842 ROU asset	(7,495)	—
Derivative liability	(423)	—
Total deferred tax liabilities	(109,352)	(119,408)
Net deferred tax liability	\$ —	\$ (6,631)

At December 31, 2019 and 2018, the Company has approximately \$0.5 million (after amortization of \$1.4 million) and \$0.6 million (after amortization of \$1.3 million), respectively, of start-up expenses capitalized for income tax purposes with amortization available to offset future federal, state and local income tax.

As of December 31, 2019 and 2018, the Company has approximately \$1,014.8 million and \$790.0 million, respectively, of federal NOL carry-forwards which expire through 2037. Included in the \$1,014.8 million of federal NOLs are losses of \$432.8 million that will carry forward indefinitely as a result of the Tax Cuts and Jobs Act. Additionally, at December 31, 2019 and 2018, the Company has approximately \$1,374.0 million and \$442.4 million, respectively, of state NOL carry-forwards which expired through 2039. The Company also has approximately \$5.8 million of federal research and development tax credit carryforwards which expire through 2039 and \$4.9 million of state research and development tax credit carryforwards which expire through 2038.

Under the provisions of the Internal Revenue Code, the net operating losses and tax credit carry-forwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. Net operating losses and tax credit carryforwards may become subject to an annual limitation under Internal Revenue Code 382 and 383 if there is more than a 50% change in ownership of the stockholders that own 5% or more of the Company's outstanding stock over a three-year period. The Company completed an evaluation of its ownership changes and concluded that an ownership change did occur on December 12, 2018 for both Akebia and Keryx in connection with the Merger. As a consequence of this ownership change, the Company's NOL's and tax credit carryforwards allocable to the tax periods preceding the ownership change became subject to limitation under Section 382. The Company reduced its associated deferred tax assets by \$44.9 million as a result of the limitation.

The Company generated research credits but has not conducted a formal study to document its qualified activities. This study may result in an adjustment to the Company's research and development credit carryforwards; however, until a study is completed and any

adjustment is known, no amounts are being presented as an uncertain tax position. A valuation allowance has been provided against the Company's research and development credits and, if an adjustment is required, this adjustment would be offset by an adjustment to the deferred tax asset established for the research and development credit carry-forwards and the valuation allowance.

The Company files income tax returns in the U.S. federal and various state and local jurisdictions. For federal and state income tax purposes, the 2018, 2017 and 2016 tax years remain open for examination under the normal three-year statute of limitations. The statute of limitations for income tax audits in the United States will commence upon utilization of net operating losses and will expire three years from the filing of the tax return the loss was utilized on.

There was no accrual for uncertain tax positions or for interest and penalties related to uncertain tax positions for 2019, 2018 and 2017. The Company does not believe that there will be a material change in its unrecognized tax positions over the next twelve months. All of the unrecognized tax benefits, if recognized, would be offset by the valuation allowance.

15. Employee Retirement Plan

During 2008, the Company established a retirement plan, or the Plan, authorized by Section 401(k) of the Internal Revenue Code. In accordance with the Plan, all employees who have attained the age of 21 are eligible to participate in the Plan as of the first Entry Date, as defined, following their date of employment. Each employee can contribute a percentage of compensation up to a maximum of the statutory limits per year. Company contributions are discretionary and contributions in the amount of approximately \$1.3 million, \$0.3 million and \$0.2 million were made during the years ended December 31, 2019, 2018 and 2017, respectively.

16. Commitments and Contingencies

Leases

The Company leases approximately 65,167 square feet of office and lab space in Cambridge, Massachusetts under a lease which was most recently amended in April 2018, collectively the Cambridge Lease. Under the Third Amendment to the Cambridge Lease, or the Third Amendment, executed in July 2016, total monthly lease payments under the initial base rent were approximately \$242,000 and are subject to annual rent escalations. In addition to such annual rent escalations, base rent payments for a portion of said premises commenced on January 1, 2017 in the monthly amount of approximately \$22,000. The Fourth Amendment to the Cambridge Lease, executed in May 2017, provided additional storage space to the Company and did not impact rent payments. In April 2018, the Company entered into a Fifth Amendment to the Cambridge Lease, or the Fifth Amendment, for an additional 19,805 square feet of office space on the 12th floor. Monthly lease payments for the existing 45,362 square feet of office and lab space, under the Third Amendment, remain unchanged. The new space leased by the Company was delivered in September 2018 and additional monthly lease payments of approximately \$135,000 commenced in February 2019 and are subject to annual rent escalations, which commenced in September 2019.

Additionally, as a result of the Merger, the Company now has a lease for 27,300 square feet of office space in Boston, Massachusetts, or the Boston Lease, which expires in February 2023. The total monthly lease payments under the base rent are approximately \$136,000 and are subject to annual rent escalations.

The term of the Cambridge Lease with respect to the office space expires on September 11, 2026, with one five-year extension option available. The term of the Cambridge Lease with respect to the lab space expires on November 30, 2021, with an extension option for one additional period of two years. The term of the Boston Lease office space expires on February 28, 2023, with an extension option for one additional five-year extension option available. The renewal options in the Company's real estate leases were not included in the calculation of the operating lease assets and operating lease liabilities as the renewal is not reasonably certain. The lease agreements do not contain residual value guarantees. Operating lease costs for the year ended December 31, 2019 were \$6.6 million and cash paid for amounts included in the measurement of operating lease liabilities for the year ended December 31, 2019 were \$6.9 million.

In September 2019, Keryx entered into an agreement to sublease the Boston office space to Foundation Medicine, Inc., or Foundation. The sublease is subject and subordinate to the Boston Lease between Keryx and the landlord. The term of the sublease commenced on October 16, 2019, upon receipt of the required consent from the landlord for the sublease agreement, and expires on February 27, 2023. Foundation is obligated to pay Keryx rent that approximates the rent due from Keryx to its landlord with respect to the Boston Lease. Sublease rental income is recorded to other income. Keryx continues to be obligated for all payment terms pursuant to the Boston Lease, and the Company will guaranty Keryx's obligations under the sublease. Keryx received \$0.2 million in rent payments from Foundation during the year ended December 31, 2019.

The Company has not entered into any material short-term leases or financing leases as of December 31, 2019.

The total security deposit in connection with the Cambridge Lease is \$1.6 million as of December 31, 2019. Additionally, the Company recorded \$0.8 million for the security deposit under the Boston Lease. Both the Cambridge Lease and the Boston Lease have their security deposits in the form of a letter of credit, all of which are included in prepaid expenses and other current assets in the Company's consolidated balance sheet as of December 31, 2019.

As of December 31, 2019, undiscounted minimum rental commitments under non-cancelable leases, for each of the next five years and total thereafter are as follows:

	<u>Operating Leases</u> (in thousands)	<u>Lease Payments to be Received from Sublease</u>	<u>Net Operating Lease Payments</u>
2020	\$ 6,568	\$ 1,769	\$ 4,799
2021	7,064	1,797	5,267
2022	6,735	1,824	4,911
2023	5,347	307	5,040
2024	5,116		5,116
Thereafter	8,818		8,818
Total	\$ 39,648	\$ 5,697	\$ 33,951

In arriving at the operating lease liabilities, the Company applied incremental borrowing rates ranging from 5.91% to 6.94%, which were based on the remaining lease term at the date of adoption of ASC 842. As of December 31, 2019, the remaining lease terms ranged from 1.92 years to 6.70 years. As of December 31, 2019, the following represents the difference between the remaining undiscounted minimum rental commitments under non-cancelable leases and the operating lease liabilities:

	<u>Operating Leases</u> (in thousands) Total
Undiscounted minimum rental commitments	\$ 39,648
Present value adjustment using incremental borrowing rate	(7,133)
Operating lease liabilities	\$ 32,515

At December 31, 2018, the Company's future minimum payments required under these leases are as follows:

	<u>Operating Lease</u> (in thousands)
2019	\$ 6,777
2020	7,008
2021	7,064
2022	6,735
2023	5,347
Thereafter	13,934
Total	\$ 46,865

The Company recorded approximately \$3.7 million and \$3.2 million in rent expense for the years ended December 31, 2018 and 2017, respectively.

Manufacturing Agreements

As part of the Merger, the Company retained Keryx's commercial supply agreements with BioVectra and Siegfried Evionnaz SA, or Siegfried, to supply commercial drug substance for Auryxia.

Pursuant to the Manufacture and Supply Agreement with BioVectra and the Product Manufacture and Supply and Facility Construction Agreement with BioVectra, collectively the BioVectra Agreement, the Company has agreed to purchase a minimum quantity of drug substance of Auryxia at predetermined prices. The price per kilogram will decrease with an increase in quantity above the minimum purchase quantity. In addition, the BioVectra Agreement contained contingent milestone payments for capital developments in connection with construction of an expansion of the site of the BioVectra production facility for the manufacture of drug substance for Auryxia. These milestone payments were achieved by BioVectra and fully recorded prior to the Merger. These milestone payments are recorded in other assets and amortized into drug substance as inventory is released to the Company. The term of the BioVectra Agreement expires in late 2026, after which, it automatically renews for specified terms until terminated. The Company may terminate the BioVectra Agreement prior to the expiration of the contract term, which could result in early termination fee. As of December 31, 2019, the Company is required to purchase a minimum quantity of drug substance for Auryxia annually at a total cost of approximately \$135.3 million through the end of the contract term.

As part of purchase accounting, the Company identified an executory contract in the BioVectra Agreement, which includes future firm purchase commitments. This executory contract was deemed to have an off-market element related to the amount of purchase commitments that exceed the current forecast. As a result, the Company recorded a liability of \$29.5 million in purchase accounting, as of the acquisition date for the fair value of the off-market element. Through December 31, 2019, the Company recorded \$0.7 million in accretion expense related to the present value discount associated with this liability.

Pursuant to the Siegfried Master Manufacturing Services and Supply Agreement, or the Siegfried Agreement, the Company has agreed to purchase a minimum quantity of drug substance of Auryxia at predetermined prices. The price per kilogram will decrease with an increase in quantity above the minimum purchase quantity. The term of the Siegfried Agreement expires on December 31, 2021, after which, it automatically renews for one-year terms until terminated. The Siegfried Agreement provides for certain termination rights prior to December 31, 2021 for the Company. As of December 31, 2019, the Company is required to purchase a minimum quantity of drug substance for Auryxia annually at a total cost of approximately \$60.8 million through the year ending December 31, 2021.

On April 9, 2019, the Company entered into a Supply Agreement with Esteve Química, S.A., or Esteve, or the Esteve Agreement. The Esteve Agreement includes the terms and conditions under which Esteve will manufacture vadaustat drug substance, or API, for commercial use.

Pursuant to the Esteve Agreement, the Company shall provide rolling forecasts to Esteve on a quarterly basis, or the Forecast. The Forecast shall reflect the Company's needs for API produced by Esteve over a certain number of months, represented as a quantity of API per calendar quarter. The parties have agreed to a volume-based pricing structure under the Esteve Agreement. The Esteve Agreement has an initial term of four years, beginning April 9, 2019 and ending April 9, 2023. Subsequent to December 31, 2019, the Company has a minimum commitment with Esteve for \$5.8 million through the first quarter of 2021.

Other Third Party Contracts

Under the Company's agreement with IQVIA to provide contract research organization services for the PRO₂TECT and INNO₂VATE programs, the total remaining contract costs as of December 31, 2019 were approximately \$34.9 million, of which Otsuka reimburses a significant portion back to the Company. The estimated period of substantive performance for the committed work with IQVIA is through the end of 2020. The Company also contracts with various other organizations to conduct research and development activities with remaining contract costs to the Company of approximately \$61.4 million at December 31, 2019. The scope of the services under these research and development contracts can be modified and the contracts cancelled by the Company upon written notice. In some instances, the contracts may be cancelled by the third party upon written notice.

17. Net Loss per Share

The shares in the table below were excluded from the calculation of diluted net loss per share, prior to the use of the treasury stock method, due to their anti-dilutive effect:

	Year ended December 31,		
	2019	2018	2017
Warrants	509,611	509,611	509,611
Outstanding stock options	7,670,899	8,346,888	3,660,014
Unvested restricted stock units	4,524,132	962,316	728,738
Total	12,704,642	9,818,815	4,898,363

18. Quarterly Results (unaudited)

	Three Months Ended			
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019
(in thousands, except per share data) (unaudited)				
Product revenue, net	\$ 23,111	\$ 29,089	\$ 30,004	\$ 28,915
License, collaboration and other revenue	\$ 49,555	\$ 71,714	\$ 61,973	\$ 40,640
Cost of goods sold	\$ 31,257	\$ 37,669	\$ 38,263	\$ 38,147
Operating expenses	\$ 117,378	\$ 122,657	\$ 109,619	\$ 126,299
Loss from operations	\$ (75,969)	\$ (59,523)	\$ (55,905)	\$ (94,891)
Other income (expense), net	\$ 791	\$ 508	\$ 43	\$ (1,344)
Benefit for income taxes	\$ (2,757)	\$ (845)	\$ (1,277)	\$ (1,752)
Net loss	\$ (72,421)	\$ (58,170)	\$ (54,585)	\$ (94,483)
Net loss per share:				
basic and diluted	\$ (0.62)	\$ (0.49)	\$ (0.46)	\$ (0.79)
Weighted-average number of common shares:				
basic and diluted	117,063,352	118,268,832	118,863,063	119,358,081
	Three Months Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
(in thousands, except per share data) (unaudited)				
Product revenue, net	\$ —	\$ —	\$ —	\$ 6,824
License, collaboration and other revenue	\$ 45,930	\$ 48,793	\$ 53,169	\$ 53,026
Cost of goods sold	\$ —	\$ —	\$ —	\$ 7,768
Operating expenses	\$ 70,428	\$ 84,455	\$ 81,012	\$ 142,240
Loss from operations	\$ (24,498)	\$ (35,662)	\$ (27,843)	\$ (90,158)
Other income, net	\$ 1,080	\$ 1,593	\$ 1,796	\$ 1,766
Benefit for income taxes	\$ —	\$ —	\$ —	\$ (28,338)
Net loss	\$ (23,418)	\$ (34,069)	\$ (26,047)	\$ (60,054)
Net loss per share:				
basic and diluted	\$ (0.48)	\$ (0.60)	\$ (0.46)	\$ (0.87)
Weighted-average number of common shares:				
basic and diluted	48,613,565	56,890,295	57,027,598	69,404,187

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Management's Evaluation of our Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is (1) recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms and (2) accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding required disclosure.

As of December 31, 2019, our management, with the participation of Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our Chief Executive Officer and Chief Financial Officer have concluded based upon the evaluation described below that, as of December 31, 2019, our disclosure controls and procedures were not effective because of a material weakness in our internal control over financial reporting relating to our inventory process which is described in more detail below.

Management's Annual Report on Internal Control over Financial Reporting

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rule 13a-15(f) or 15d-15(f) promulgated under the Securities Exchange Act of 1934 as a process designed by, or under the supervision of, the Company's Chief Executive Officer and Chief Financial Officer and effected by the Company's board of directors, management and other personnel to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America and includes those policies and procedures that:

- (1) Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets;
- (2) Provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the issuer are being made only in accordance with authorizations of management and directors; and
- (3) Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the Company's consolidated financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies or procedures may deteriorate.

Management conducted an assessment of the effectiveness of our internal control over financial reporting based on the criteria set forth in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, or COSO. Based on the assessment, management has concluded that our internal control over financial reporting as of December 31, 2019 was not effective due to the following material weakness: the Company did not design and maintain effective controls over the completeness, accuracy and presentation and disclosure of inventory. A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of a company's annual or interim consolidated financial statements will not be prevented or detected on a timely basis. Specifically, we did not maintain effective controls related to (i) the review of inventory unit and valuation reconciliations, (ii) the annual validation of the inventory costing and (iii) the periodic assessment of inventory expiry and related reserves.

No adjustments to the Company's current or prior period financial statements were required as a result of the aforementioned deficiencies in internal controls. Management is currently taking actions to remediate the deficiencies in its internal controls over financial reporting and is implementing additional processes and controls designed to address the underlying causes associated with the above-mentioned material weakness. Management is committed to remediating the deficiencies described above and their internal control remediation efforts are expected to include the following: (i) providing training to individuals with internal control responsibilities including review documentation requirements, (ii) evaluating alignment of resources and enhancing management review and monitoring of inventory controls, (iii) review current inventory processes and procedures to identify opportunities to enhance their design and operation, (iv) design controls that address the completeness and accuracy of any key reports utilized in the execution of internal controls and (v) perform control testing throughout the year to validate the operating effectiveness of internal controls over financial reporting to gain assurance that such controls are present and functioning as designed.

Management will monitor the progress of the remediation plan and report regularly to the audit committee on the progress and results of the remediation plan, including the identification, status and resolution of internal control deficiencies.

Changes in Internal Control over Financial Reporting

Except as noted in the preceding paragraphs, there have been no changes in the Company's internal control over financial reporting during the fourth quarter of 2019, as such term is defined in Rules 13a-15(f) and 15(d)-15(f) promulgated under the Exchange Act, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Ernst & Young, LLP, the Company's independent registered public accounting firm, has issued an auditor's report on management's assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2019. This report is included below.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Akebia Therapeutics, Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Akebia Therapeutics, Inc.'s internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, because of the effect of the material weakness described below on the achievement of the objectives of the control criteria, Akebia Therapeutics, Inc. (the "Company") has not maintained effective internal control over financial reporting as of December 31, 2019, based on the COSO criteria.

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weakness has been identified and included in management's assessment. Specifically, the Company did not maintain effective controls related to (i) the review of inventory unit and valuation reconciliations, (ii) the annual validation of the inventory costing and (iii) the periodic assessment of inventory expiry and related reserves.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes. This material weakness was considered in determining the nature, timing and extent of audit tests applied in our audit of the 2019 consolidated financial statements, and this report does not affect our report dated March 12, 2020, which expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 12, 2020

Item 9B. Other Information

Commercial Supply Agreement

On March 11, 2020, Akebia entered into a Supply Agreement (“Patheon Supply Agreement”) with Patheon Inc. (“Patheon”). The Patheon Supply Agreement includes the terms and conditions under which Patheon will manufacture vadadustat drug product for commercial use.

Pursuant to the Patheon Supply Agreement, Akebia will provide Patheon a long-term forecast on an annual basis, as well as short-term forecasts on a quarterly basis. The forecasts shall reflect Akebia’s needs for commercial supply of vadadustat drug product produced by Patheon, represented as a quantity of drug product per calendar quarter. The parties have agreed to a volume-based pricing structure under the Patheon Supply Agreement. Pursuant to the Patheon Supply Agreement, Akebia agreed to purchase a certain percentage of its or its affiliates’ global demand for vadadustat drug product for commercial purposes from Patheon.

The initial term of the Patheon Supply Agreement is March 11, 2020 to June 30, 2023. The Patheon Supply Agreement will automatically renew for successive one-year terms, unless either party gives prior written notice of its intent to terminate. The Patheon Supply Agreement allows either party to terminate in the event of a material breach.

The Patheon Supply Agreement includes customary indemnification, intellectual property protection, confidentiality, remedies, and warranties terms, as well as certain quality requirements.

The foregoing description of the Patheon Supply Agreement is a summary, is not complete, and is qualified in its entirety by the terms and conditions of the Patheon Supply Agreement, which will be filed as an exhibit to our Quarterly Report on Form 10-Q for the quarter ending March 31, 2020.

PART III

Item 10. Director, Executive Officers and Corporate Governance

The information required by this Item 10 will be included in our Definitive Proxy Statement to be filed with the Securities and Exchange Commission, or SEC, with respect to our 2020 Annual Meeting of Stockholders and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this Item 11 will be included in our Definitive Proxy Statement to be filed with the SEC with respect to our 2020 Annual Meeting of Stockholders and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information relating to security ownership of certain beneficial owners of our common stock and information relating to the security ownership of our management required by this Item 12 will be included in our Definitive Proxy Statement to be filed with the SEC with respect to our 2020 Annual Meeting of Stockholders and is incorporated herein by reference.

Equity Compensation Plan Information

The following table sets forth information as of December 31, 2019 regarding shares of our common stock that may be issued under our equity compensation plans, consisting of our Amended and Restated 2008 Equity Incentive Plan, our 2014 Incentive Plan, as amended, and our Amended and Restated 2014 Employee Stock Purchase Plan, and our inducement award program. As of the closing of our initial public offering, no additional equity awards were made under our Amended and Restated 2008 Equity Incentive Plan. Our Amended and Restated 2008 Equity Incentive Plan, our 2014 Incentive Plan, as amended, and our Amended and Restated 2014 Employee Stock Purchase Plan were approved by our shareholders. The inducement award program was approved by our Board of Directors in May 2016 exclusively for the grant of equity awards to individuals who were not previously an employee or non-employee director of the Company, or following a bona fide period of non-employment, as an inducement material to such individual's entering into employment with the Company, pursuant to Rule 5635(c)(4) of the Nasdaq Listing Rules.

<u>Plan Category</u>	<u>Number of securities to be issued upon exercise of outstanding options, warrants and rights</u> (a)	<u>Weighted-average exercise price of outstanding options, warrants and rights(\$)</u> (b)	<u>Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))</u> (c)
Equity compensation plans approved by security holders	10,006,118 (1)	5.90 (2)	8,699,248 (3)
Equity compensation plans not approved by security holders (4)	2,188,913	7.41	—
Total	12,195,031	6.17	8,699,248

(1) Includes 5,481,986 shares of Common Stock issuable upon the exercise of outstanding options and 4,524,132 shares of our common stock issuable upon the vesting of restricted stock units, or RSUs.

(2) Does not include purchase rights accruing under the Amended and Restated 2014 Employee Stock Purchase Plan because the purchase right, and therefore the number of shares to be purchased, will not be determined until the end of the purchase period. In addition, RSUs issued under our equity compensation plans do not require payment by the recipient to us at the time of vesting. As such, the weighted-average exercise price does not take these awards into account

(3) As of December 31, 2019, there were 2,983,256 shares of our common stock available for grant under the 2014 Incentive Plan, as amended, and 5,715,992 shares of our common stock available for grant under the Amended and Restated 2014 Employee Stock Purchase Plan.

(4) This amount is under the inducement award program.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this Item 13 will be included in our Definitive Proxy Statement to be filed with the SEC with respect to our 2020 Annual Meeting of Stockholders and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required by this Item 14 will be included in our Definitive Proxy Statement to be filed with the SEC with respect to our 2020 Annual Meeting of Stockholders and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a) Documents filed as part of this Annual Report on Form 10-K.

(1) Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

Consolidated Balance Sheets

Consolidated Statements of Operations and Comprehensive Loss

Consolidated Statements of Stockholders' Equity (Deficit)

Consolidated Statements of Cash Flows

Notes to Consolidated Financial Statements

(2) Schedules

Schedules have been omitted as all required information has been disclosed in the financial statements and related footnotes.

(3) Exhibits

The Exhibits listed below are filed as part of this Annual Report on Form 10-K.

Exhibit Number	Description of Exhibit
2.1**	<u>Agreement and Plan of Merger, dated as of June 28, 2018, by and among Akebia Therapeutics, Inc., Alpha Therapeutics Merger Sub, Inc., and Keryx Biopharmaceuticals, Inc. (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K, filed on June 28, 2018)</u>
2.2	<u>First Amendment to Agreement and Plan of Merger, dated as of October 1, 2018, by and among Akebia Therapeutics, Inc., Alpha Therapeutics Merger Sub, Inc. and Keryx Biopharmaceuticals, Inc. (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K, filed on October 1, 2018)</u>
3.1	<u>Ninth Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K, filed on March 28, 2014)</u>
3.2	<u>Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K, filed on March 28, 2014)</u>
4.1	<u>Form of Common Stock Certificate (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014)</u>
4.2	<u>Fourth Amended and Restated Investors' Rights Agreement, dated March 5, 2014 (incorporated by reference to Exhibit 4.4 to the Company's 10-K for the year ending December 31, 2014 and filed on March 4, 2015)</u>
4.3#	<u>Common Stock Purchase Warrant between Akebia Therapeutics, Inc. and Janssen Pharmaceutica NV, dated February 9, 2017 (incorporated by reference to Exhibit 4.1 to the Company's Quarterly Report on Form 10-Q, filed on May 9, 2017)</u>
4.4#	<u>Investment Agreement between Akebia Therapeutics, Inc. and Vifor (International) Ltd., dated May 12, 2017 (incorporated by reference to Exhibit 4.1 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2017)</u>
4.5	<u>Amendment No. 1 to Fourth Amended and Restated Investors' Rights Agreement, dated June 28, 2017 (incorporated by reference to Exhibit 4.5 to the Company's Annual Report on Form 10-K, filed on March 12, 2018)</u>
4.6*	<u>Description of Registrant's Securities</u>

Exhibit Number	Description of Exhibit
10.1†	<u>Form of Director and Officer Indemnification Agreement (incorporated by reference to Exhibit 10.1 to the Company's Annual Report on Form 10-K, filed on March 12, 2018)</u>
10.2	<u>Office Lease Agreement Between MA-Riverview/245 First Street, L.L.C. and Akebia Therapeutics, Inc., dated December 3, 2013 (incorporated by reference to Exhibit 10.2 to the Company's Registration Statement on Form S-1 (333-193969), filed on February 14, 2014)</u>
10.3	<u>First Amendment to Office Lease Agreement Between Jamestown Premier 245 First, LLC and Akebia Therapeutics, Inc., dated December 15, 2014 (incorporated by reference to Exhibit 10.3 to the Company's 10-K for the year ending December 31, 2014 and filed on March 4, 2015)</u>
10.4	<u>Second Amendment to Office Lease Agreement Between Jamestown Premier 245 First, LLC and Akebia Therapeutics, Inc., dated November 23, 2015 (incorporated by reference to Exhibit 10.4 to the Company's 10-K for the year ending December 31, 2015 and filed on March 14, 2016)</u>
10.5	<u>Third Amendment to Office Lease Agreement Between Jamestown Premier 245 First, LLC and Akebia Therapeutics, Inc., dated July 25, 2016 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on November 9, 2016)</u>
10.6	<u>Fourth Amendment to Office Lease Agreement Between CLPF-Cambridge Science Center, LLC and Akebia Therapeutics, Inc., dated May 1, 2017 (incorporated by reference to Exhibit 10.6 to the Company's 10-K for the year ending December 31, 2017, filed on March 12, 2018)</u>
10.7	<u>Fifth Amendment to Office Lease Agreement Between CLPF-Cambridge Science Center, LLC and Akebia Therapeutics, Inc. dated April 9, 2018 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2018)</u>
10.8	<u>One Marina Park Drive Office Lease dated April 29, 2015, by and between Keryx Biopharmaceuticals, Inc. and Fallon Cornerstone One MPD LLC (incorporated by reference to Exhibit 10.29 to Keryx Biopharmaceuticals, Inc.'s Annual Report on Form 10-K, filed on March 1, 2017)</u>
10.9	<u>Sublease, dated as of September 9, 2019, by and between Keryx Biopharmaceuticals, Inc. and Foundation Medicine, Inc. (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on November 12, 2019)</u>
10.10†	<u>Amended and Restated 2008 Equity Incentive Plan (incorporated by reference to Exhibit 10.5 to the Company's Registration Statement on Form S-1 (333-193969), filed on February 14, 2014)</u>
10.11†	<u>Amendment No. 1 to Amended and Restated 2008 Equity Incentive Plan (incorporated by reference to Exhibit 10.6 to the Company's Registration Statement on Form S-1 (333-193969), filed on February 14, 2014)</u>
10.12†	<u>Executive Employment Agreement with John P. Butler, dated September 16, 2013 (incorporated by reference to Exhibit 10.7 to the Company's Registration Statement on Form S-1 (333-193969), filed on February 14, 2014)</u>
10.13†	<u>Executive Employment Agreement with Jason A. Amello, dated September 23, 2013 (incorporated by reference to Exhibit 10.8 to the Company's Registration Statement on Form S-1 (333-193969), filed on February 14, 2014)</u>
10.14†	<u>Form of Non-Statutory Stock Option Agreement for officers (incorporated by reference to Exhibit 10.24 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014)</u>
10.15†	<u>Form of Non-Statutory Stock Option Agreement for non-employee directors (incorporated by reference to Exhibit 10.25 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014)</u>
10.16†	<u>Amended and Restated Non-Employee Director Compensation Program, effective January 1, 2018 (incorporated by reference to Exhibit 10.13 to the Company's 10-K for the year ending December 31, 2017 and filed on March 12, 2018)</u>
10.17†	<u>Amended and Restated Non-Employee Director Compensation Program, effective January 30, 2019 (incorporated by reference to Exhibit 10.31 to the Company's Annual Report on Form 10-K, filed on March 26, 2019)</u>
10.18†	<u>Form of Executive Severance Agreement for officers (incorporated by reference to Exhibit 10.27 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014)</u>
10.19†	<u>2014 Incentive Plan (incorporated by reference to exhibit 10.29 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014)</u>

Exhibit Number	Description of Exhibit
10.20†	Amendment No. 1 to the Akebia Therapeutics, Inc. 2014 Incentive Plan (incorporated by reference to Exhibit 4.4 to the Company's Registration Statement on Form S-8, filed on January 25, 2019).
10.21†	2014 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.30 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014).
10.22†	Amended and Restated 2014 Employee Stock Purchase Plan (incorporated by reference to Appendix A to the Company's Definitive Proxy Statement, filed with the Securities and Exchange Commission on April 26, 2019).
10.23†	Cash Incentive Plan (incorporated by reference to Exhibit 10.31 to the Company's Registration Statement on Form S-1/A (333-193969), filed on March 4, 2014).
10.24†	Form of Officer Restricted Stock Unit Award Agreement under 2014 Incentive Plan (incorporated by reference to Exhibit 10.18 to the Company's Annual Report on Form 10-K, filed on March 12, 2018).
10.25†	Form of Officer Restricted Stock Unit Award Agreement under 2014 Incentive Plan (incorporated by reference to Exhibit 10.29 to the Company's Annual Report on Form 10-K, filed on March 26, 2019).
10.26†	Form of Officer Inducement Award Non-Statutory Stock Option Agreement (incorporated by reference to Exhibit 4.4 to the Company's Registration Statement on Form S-8 (333-222728), filed on January 26, 2018).
10.27†	Form of Inducement Award Non-Statutory Stock Option Agreement for non-officers (incorporated by reference to Exhibit 4.5 to the Company's Registration Statement on Form S-8 (333-222728), filed on January 26, 2018).
10.28†	Keryx Biopharmaceuticals, Inc. 1999 Stock Option Plan (incorporated by reference to Exhibit 10.2 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q, filed on March 21, 2003).
10.29†	Keryx Biopharmaceuticals, Inc. 2004 Long-Term Incentive Plan (incorporated by reference to Annex C to Keryx Biopharmaceuticals, Inc.'s Definitive Proxy Statement on Schedule 14A, filed on April 29, 2004).
10.30†	Amendment to the Keryx Biopharmaceuticals, Inc. 2004 Long-Term Incentive Plan dated April 11, 2006 (incorporated by reference to Exhibit 10.1 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q, filed on August 9, 2006).
10.31†	Keryx Biopharmaceuticals, Inc. 2007 Incentive Plan (incorporated by reference to Annex D to Keryx Biopharmaceuticals, Inc.'s Definitive Proxy Statement on Schedule 14A, filed on April 30, 2007).
10.32†	Keryx Biopharmaceuticals, Inc. Amended and Restated 2013 Incentive Plan (incorporated by reference to Exhibit 10.1 to Keryx Biopharmaceuticals, Inc.'s Current Report on Form 8-K, filed on May 27, 2016).
10.33†	Keryx Biopharmaceuticals, Inc. 2018 Equity Incentive Plan (incorporated by reference to Exhibit 99.1 to Keryx Biopharmaceuticals, Inc.'s Registration Statement on Form S-8, filed on June 29, 2018).
10.34†	Form of Indemnification Agreement between Keryx Biopharmaceuticals, Inc. and its directors and officers (incorporated by reference to Exhibit 10.1 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q, filed on November 9, 2016).
10.35†	Form of Employee Agreement (Confidentiality, Non-Competition, Non-Solicitation and Development Agreement) applicable to officers (incorporated by reference to Exhibit 10.56 to the Company's Annual Report on Form 10-K, filed on March 26, 2019).
10.36†	Keryx Biopharmaceuticals, Inc. Fourth Amended and Restated Directors Equity Compensation Plan (incorporated by reference to Exhibit 10.2 to Keryx Biopharmaceuticals, Inc.'s Current Report on Form 8-K, filed on May 27, 2016).
10.37†	Keryx Biopharmaceuticals, Inc. Third Amended and Restated Directors Equity Compensation Plan (incorporated by reference to Exhibit 10.1 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2014, filed on August 7, 2014).
10.38†	Keryx Biopharmaceuticals, Inc. Director Non-Statutory Stock Option Award Terms and Conditions under the Third Amended and Restated Directors Equity Compensation Plan (incorporated by reference to Exhibit 10.59 to the Company's Annual Report on Form 10-K, filed on March 26, 2019).

Exhibit Number	Description of Exhibit
10.39†	Master Consulting Services Agreement, dated as of June 10, 2019, by and between Akebia Therapeutics, Inc. and Scott A. Canute (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2019)
10.40#	Master Services Agreement, between Akebia Therapeutics, Inc., and Quintiles, Inc., dated as of June 8, 2015 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on August 11, 2015)
10.41#	Collaboration Agreement between Akebia Therapeutics, Inc. and Mitsubishi Tanabe Pharma Corporation, dated December 11, 2015 (incorporated by reference to Exhibit 10.29 to the Company's 10-K for the year ending December 31, 2015 and filed on March 14, 2016)
10.42#	Letter Agreement between Akebia Therapeutics, Inc. and Mitsubishi Tanabe Pharma Corporation, dated September 26, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on November 8, 2017)
10.43#	Collaboration and License Agreement, between Akebia Therapeutics, Inc. and Otsuka Pharmaceutical Co. Ltd., dated December 18, 2016 (incorporated by reference to Exhibit 10.26 to the Company's 10-K for the year ending December 31, 2016 and filed on March 6, 2017)
10.44#	Collaboration and License Agreement between Akebia Therapeutics, Inc. and Otsuka Pharmaceutical Co. Ltd., dated April 25, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2017)
10.45#	Research and License Agreement between Akebia Therapeutics, Inc. and Janssen Pharmaceutica NV, dated February 9, 2017 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on May 9, 2017)
10.46#	Amended and Restated License Agreement, dated April 8, 2019, by and between Akebia Therapeutics, Inc. and Vifor (International) Ltd. (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2019)
10.47	Amended and Restated Controlled Equity OfferingSM Sales Agreement, dated November 12, 2019, by and between Akebia Therapeutics, Inc. and Cantor Fitzgerald & Co. (incorporated by reference to Exhibit 1.1 to the Company's Current Report on Form 8-K, filed on November 12, 2019)
10.48	Registration Rights Agreement, dated December 12, 2018, by and between Akebia Therapeutics, Inc. and Baupost Group Securities, L.L.C. (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on December 13, 2018)
10.49	Notes Conversion Agreement, dated as of June 28, 2018, by and among Akebia Therapeutics, Inc., Keryx Biopharmaceuticals, Inc. and Baupost Group Securities, L.L.C. (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, filed on June 28, 2018)
10.50#	Second Amended and Restated License Agreement dated April 17, 2019, by and between Akebia Therapeutics, Inc. and Panion & BF Biotech, Inc. (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2019)
10.51	Reserved
10.52	Reserved
10.53#	Amended and Restated Sub-License Agreement, dated June 8, 2009, as amended by the First Amendment thereto, dated June 12, 2013, by and between Keryx Biopharmaceuticals, Inc., Japan Tobacco, Inc. and Torii Pharmaceutical Co., Ltd (incorporated by reference to Exhibit 10.1 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q, filed on November 7, 2017)

Exhibit Number	Description of Exhibit
10.54#	Master Manufacturing Services Agreement by and between Keryx Biopharmaceuticals, Inc. and Patheon Manufacturing Services LLC and certain of its affiliates, dated September 27, 2016, and related Product Agreement dated September 27, 2016, and related Product Agreement dated October 12, 2016 (incorporated by reference to Exhibit 10.12 to Keryx Biopharmaceuticals, Inc.'s Annual Report on Form 10-K, filed on March 1, 2017)
10.55#	Product Agreement, dated August 29, 2017, by and between Keryx Biopharmaceuticals, Inc. and Patheon Inc. (an affiliate of Patheon Manufacturing Services LLC) related to the Master Manufacturing Services Agreement by and between Keryx Biopharmaceuticals, Inc. and Patheon Manufacturing Services LLC and certain of its affiliates dated November 12, 2016 (incorporated by reference to Exhibit 10.2 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q, filed on November 7, 2017)
10.56#	Product Manufacture and Supply and Facility Construction Agreement, dated December 11, 2017, by and between Keryx Biopharmaceuticals, Inc. and BioVectra Inc. (incorporated by reference to Exhibit 10.12 to Keryx Biopharmaceuticals, Inc.'s Annual Report on Form 10-K, filed on February 21, 2018)
10.57#	Master Manufacturing Services and Supply Agreement, dated December 20, 2017, by and between Keryx Biopharmaceuticals, Inc. and Siegfried Evionnaz SA (incorporated by reference to Exhibit 10.13 to Keryx Biopharmaceuticals, Inc.'s Annual Report on Form 10-K, filed on February 21, 2018)
10.58#	Amendment No. 1 to the Product Manufacture and Supply and Facility Construction Agreement, dated May 5, 2018, by and between Keryx Biopharmaceuticals, Inc. and BioVectra Inc. (incorporated by reference to Exhibit 10.6 to Keryx Biopharmaceuticals, Inc.'s Quarterly Report on Form 10-Q, filed on August 9, 2018)
10.59#	Exclusive Distribution Agreement between Keryx Biopharmaceuticals, Inc. and Cardinal Health 105, Inc., dated October 16, 2014 and Amendment to Exclusive Distribution Agreement between Keryx Biopharmaceuticals, Inc. and Cardinal Health 105, Inc., dated April 14, 2015 (incorporated by reference to Exhibit 10.60 to the Company's Annual Report on Form 10-K, filed on March 26, 2019)
10.60#	Manufacture and Supply Agreement between Keryx Biopharmaceuticals, Inc. and BioVectra Inc., dated May 26, 2017 and Amendment to Manufacture and Supply Agreement between Keryx Biopharmaceuticals, Inc. and BioVectra Inc., dated December 11, 2017 (incorporated by reference to Exhibit 10.61 to the Company's Annual Report on Form 10-K, filed on March 26, 2019)
10.61#	Supply Agreement, dated as of April 9, 2019, by and between Akebia Therapeutics, Inc. and Esteve Química, S.A. (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q, filed on August 8, 2019)
10.62!*	Loan Agreement, dated November 11, 2019, by and among the Company, Keryx Biopharmaceuticals, Inc., Biopharma Credit plc and Biopharma Credit Investments V (Master) LP
10.63!*	Guaranty and Security Agreement, dated November 25, 2019, by and between the Company, Keryx Biopharmaceuticals, Inc. and Biopharma Credit plc
21.1*	List of Subsidiaries
23.1*	Consent of Ernst & Young LLP
31.1*	Certification of Principal Executive Officer Required Under Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended
31.2*	Certification of Principal Financial Officer Required Under Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended
32.1*	Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. 1350
101.INS*	XBRL Instance Document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Labels Linkbase Document

Exhibit Number	Description of Exhibit
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

- * Filed, or submitted electronically, herewith
- † Indicates management contract or compensatory plan
- # Indicates portions of the exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment
- ! Indicates portions of the exhibit (indicated by asterisks) have been omitted pursuant to Item 601(b)(10)(iv) of Regulation S-K
- ** The schedules to the Agreement and Plan of Merger have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The Company will furnish copies of such schedules to the Securities and Exchange Commission upon request by the Commission

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

AKEBIA THERAPEUTICS, INC.

Date: March 12, 2020

By: /s/ John P. Butler
John P. Butler
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report was signed by the following persons on behalf of the registrant and in the capacities and on the date indicated.

Date: March 12, 2020

By: /s/ John P. Butler
John P. Butler
Director, President and Chief Executive Officer (Principal Executive Officer)

Date: March 12, 2020

By: /s/ Jason A. Amello
Jason A. Amello
Senior Vice President, Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)

Date: March 12, 2020

By: /s/ Adrian Adams
Adrian Adams
Chairman

Date: March 12, 2020

By: /s/ Mark J. Enyedy
Mark J. Enyedy
Director

Date: March 12, 2020

By: /s/ Steven C. Gilman
Steven C. Gilman
Director

Date: March 12, 2020

By: /s/ Maxine Gowen
Maxine Gowen
Director

Date: March 12, 2020

By: /s/ Michael T. Heffernan
Michael T. Heffernan
Director

Date: March 12, 2020

By: /s/ Jodie P. Morrison
Jodie P. Morrison
Director

Date: March 12, 2020

By: /s/ Michael Rogers
Michael Rogers
Director

Date: March 12, 2020

By: /s/ Cynthia Smith
Cynthia Smith
Director

DESCRIPTION OF CAPITAL STOCK

The following description of capital stock of Akebia Therapeutics, Inc. (“us,” “our,” “we” or the “Company”) is intended as a summary only and therefore is not a complete description of our capital stock. This description is based upon, and is qualified by reference to, our certificate of incorporation, our by-laws and applicable provisions of Delaware corporate law. You should read our certificate of incorporation and by-laws, which are incorporated by reference as Exhibit 3.1 and Exhibit 3.2, respectively, to the Annual Report on Form 10-K of which this Exhibit 4.6 is a part, for the provisions that are important to you.

General

Our authorized capital stock consists of 175,000,000 shares of our common stock, par value \$0.00001 per share, and 25,000,000 shares of undesignated preferred stock, par value \$0.00001 per share.

Common Stock

Dividend Rights. Subject to preferences that may apply to shares of preferred stock outstanding at the time, holders of outstanding shares of common stock are entitled to receive dividends out of assets legally available at the times and in the amounts as the Board of Directors may from time to time determine.

Voting Rights. Each outstanding share of common stock is entitled to one vote on all matters submitted to a vote of stockholders. Holders of shares of our common stock shall have no cumulative voting rights.

Conversion or Redemption Rights. Our common stock is neither convertible nor redeemable.

Liquidation Rights. Upon our liquidation, dissolution or winding up, the holders of our common stock will be entitled to receive pro rata our assets which are legally available for distribution, after payment of all debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares of preferred stock.

Rights and Preferences. Holders of common stock have no preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate in the future.

Preferred Stock

Under our certificate of incorporation, we are authorized to issue up to 25,000,000 shares of preferred stock at \$0.00001 par value per share. The preferred stock may be issued in one or more series, and the Board of Directors is expressly authorized (i) to fix the descriptions, powers, preferences, rights, qualifications, limitations and restrictions with respect to any series of preferred stock and (ii) to specify the number of shares of any series of preferred stock.

Anti-Takeover Effects of Our Certificate of Incorporation and Our Bylaws

Our certificate of incorporation and bylaws contain certain provisions that are intended to enhance the likelihood of continuity and stability in the composition of the Board of Directors and which may have the effect of delaying, deferring or preventing a future takeover or change in control of our company unless such takeover or change in control is approved by the Board of Directors.

These provisions include:

Classified Board. Our certificate of incorporation provides that, subject to the special rights of the holders of any series of Preferred Stock to elect directors, our Board of Directors is divided into three classes of directors, with the classes as nearly equal in number as possible. As a result, approximately one-third of our Board of Directors is elected each year. The classification of directors has the effect of making it more difficult for stockholders to change the composition of our Board. Our certificate of incorporation also provides that, subject to any rights of holders of preferred stock to elect additional directors under specified circumstances, the number of directors shall be fixed exclusively pursuant to a resolution adopted by our Board of Directors.

Action by Written Consent; Special Meetings of Stockholders. Our certificate of incorporation provides that stockholder action can be taken only at an annual or special meeting of stockholders and cannot be taken by written consent in lieu of a meeting. Our certificate of incorporation and the bylaws also provide that, except as otherwise required by law, special meetings of the stockholders can be called only by or at the direction of the Board of Directors pursuant to a resolution adopted by a majority of the total number of directors. Stockholders are not permitted to call a special meeting or to require the Board of Directors to call a special meeting.

Removal of Directors. Subject to the special rights of the holders of any series of Preferred Stock to elect directors, our certificate of incorporation provides that our directors may be removed only for cause by the affirmative vote of at least 75% of the votes that all our stockholders would be entitled to cast in an annual election of directors, voting together as a single class, at a meeting of the stockholders called for that purpose. This requirement of a supermajority vote to remove directors could enable a minority of our stockholders to prevent a change in the composition of our Board.

Advance Notice Procedures. Our bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the Board of Directors. Stockholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the Board of Directors or by a stockholder who was a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has given our Secretary timely written notice, in proper form, of the stockholder's intention to bring that business before the meeting. Although the bylaws do not give the Board of Directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting, the bylaws may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed or may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempting to obtain control of our company.

Super Majority Approval Requirements. The Delaware General Corporation Law generally provides that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or bylaws, unless either a corporation's certificate of incorporation or bylaws requires a greater percentage. A majority vote of our Board of Directors or the affirmative vote of holders of at least 75% of the total votes of the outstanding shares of capital stock of our company entitled to vote with respect thereto, voting together as a single class, are required to amend, alter, change or repeal the bylaws. In addition, the affirmative vote of the holders of at least 85% of the total votes of the outstanding shares of capital stock of our company entitled to vote with respect thereto, voting together as a single class, are required to amend, alter, change or repeal, or to adopt any provisions inconsistent with, any of the provisions in our certificate of incorporation relating to decreasing the number of authorized shares of common stock, issuing or changing the number of authorized shares of preferred stock, the Board of Directors, limitation of director liability, meetings of stockholders, exclusive jurisdiction for certain actions and amendments to our certificate of incorporation and bylaws. This requirement of a supermajority vote to approve amendments to our bylaws and certificate of incorporation could enable a minority of our stockholders to exercise veto power over any such amendments.

Authorized but Unissued Shares. Our authorized but unissued shares of common stock and preferred stock are available for future issuance without stockholder approval. These additional shares may be utilized for a variety of corporate purposes, including future public offerings to raise additional capital and corporate acquisitions. The existence of authorized but unissued shares of common stock and preferred stock could render more difficult or discourage an attempt to obtain control of a majority of our common stock by means of a proxy contest, tender offer, merger or otherwise.

Exclusive Forum. Our certificate of incorporation provides that, subject to limited exceptions, the state or federal courts located in the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (iii) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our bylaws, or (iv) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our certificate of incorporation described above. Although we believe these provisions benefit us by providing increased consistency in the application of Delaware law for the specified types of actions and proceedings, the provisions may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with one or more actions or proceedings described above, a court could find the choice of forum provisions contained in our certificate of incorporation to be inapplicable or unenforceable.

Section 203 of the Delaware General Corporation Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns, or did own within three years prior to the determination of interested stockholder status, 15% or more of the corporation's voting stock.

Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions: before the stockholder became interested, the Board of Directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder; upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 75% of the voting stock of the corporation outstanding at the time the transaction commenced (excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances); or at or after the time the stockholder became interested, the business combination was approved by the Board of Directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

A Delaware corporation may "opt out" of these provisions with an express provision in its original certificate of incorporation or an express provision in its certificate of incorporation or bylaws resulting from a stockholders' amendment approved by at least a majority of the outstanding voting shares. We have not opted out of these provisions. As a result, mergers or other takeover or change in control attempts of us may be discouraged or prevented.

Certain identified information has been marked in the exhibit because it is both (i) not material and (ii) would likely cause competitive harm to the Company, if publicly disclosed. Double asterisks denote omissions.

EXECUTION VERSION

LOAN AGREEMENT

Dated as of November 11, 2019

among

AKEBIA THERAPEUTICS, INC.

(as *Borrower*),

KERYX BIOPHARMACEUTICALS, INC.

(as an additional *Credit Party*),

BIOPHARMA CREDIT PLC

(as *Collateral Agent* and a *Lender*),

and

BIOPHARMA CREDIT INVESTMENTS V (MASTER) LP

(as a *Lender*)

LOAN AGREEMENT

THIS LOAN AGREEMENT (this “**Agreement**”), dated as of November 11, 2019 (the “**Effective Date**”) by and among AKEBIA THERAPEUTICS, INC., a Delaware corporation (as “**Borrower**”), KERYX BIOPHARMACEUTICALS, INC., a Delaware corporation (as an additional Credit Party), BIOPHARMA CREDIT PLC, a public limited company incorporated under the laws of England and Wales (as the “**Collateral Agent**” and a “**Lender**”) and BIOPHARMA CREDIT INVESTMENTS V (MASTER) LP, a Cayman Islands exempted limited partnership (as a “**Lender**”), provides the terms on which each Lender shall make, and Borrower shall repay, the Credit Extensions (as hereinafter defined). The parties hereto agree as follows:

1. ACCOUNTING AND OTHER TERMS

Except as otherwise expressly provided herein, all accounting terms not otherwise defined in this Agreement shall have the meanings assigned to them in conformity with Applicable Accounting Standards. Calculations and determinations must be made following Applicable Accounting Standards. If at any time any change in Applicable Accounting Standards would affect the computation of any financial requirement set forth in any Loan Document, and either Borrower or the Collateral Agent shall so request, the Collateral Agent and Borrower shall negotiate in good faith to amend such requirement to preserve the original intent thereof in light of such change in Applicable Accounting Standards; provided, that, until so amended, such requirement shall continue to be computed in accordance with Applicable Accounting Standards prior to such change therein. Without limiting the foregoing, leases shall be classified on a basis consistent with [**], unless Borrower and the Collateral Agent shall enter into a mutually acceptable amendment addressing such changes, as provided for above. Capitalized terms not otherwise defined in this Agreement shall have the meanings set forth in Section 13. All other terms contained in this Agreement, unless otherwise indicated, shall have the meaning provided by the Code to the extent such terms are defined therein. All references to “Dollars” or “\$” are United States Dollars, unless otherwise noted.

Notwithstanding anything to the contrary in this Agreement or any other Loan Document, all terms of an accounting or financial nature used herein shall be construed, and all computations of amounts and ratios referred to herein shall be made without giving effect to any treatment of [**] to value any such [**] in a reduced or bifurcated manner as described therein, and such [**] shall at all times be valued at [**]. For the avoidance of doubt, and without limitation of the foregoing, [**] shall at all times be valued at [**] and shall not include [**].

For purposes of determining compliance with Section 6 with respect to the amount of any Indebtedness in a currency other than Dollars, no Default or Event of Default shall be deemed to have occurred solely as a result of changes in rates of currency exchange occurring after the time such Indebtedness is incurred, made or acquired (so long as such Indebtedness, at the time incurred, made or acquired, was permitted hereunder).

2. LOANS AND TERMS OF PAYMENT

2.1. Promise to Pay. Borrower hereby unconditionally promises to pay Lenders the outstanding principal amount of the Term Loans advanced to Borrower by Lenders and accrued and unpaid interest thereon and any other amounts due hereunder as and when due in accordance with this Agreement.

2.2. Term Loans.

(a) Availability. Subject to the terms and conditions of this Agreement (including Sections 3.1, 3.2, 3.3 and 3.5):

(i) Each Lender severally agrees to make a term loan to Borrower on the Tranche A Closing Date in an original principal amount equal to such Lender’s Tranche A Loan Commitment (collectively, the “**Tranche A Loan**”); and

(ii) Each Lender severally agrees to make a term loan to Borrower on the Tranche B Closing Date in an original principal amount equal to such Lender’s Tranche B Loan Commitment (collectively, the “**Tranche B Loan**”).

After repayment or prepayment (in whole or in part), no Term Loan (or any portion thereof) may be re-borrowed.

(b) Repayment.

(i) Subject to clauses (ii) and (iii) of this clause (b), with respect to each applicable Term Loan Borrower shall make equal quarterly payments of principal of such Term Loan commencing on the Payment Date immediately following the 33rd-month anniversary of the applicable Closing Date and continuing through the Term Loan Maturity Date; provided, that if any such day is not a Business Day, the applicable payment shall be due and payable on the first Business Day immediately after such Payment Date.

(ii) Notwithstanding clauses (i) and (iii) of this clause (b), with respect to each applicable Term Loan, so long as no Default or Event of Default under any Loan Document has occurred and is continuing, if the Optional Amortization Condition has then been satisfied, Borrower shall have the option to elect, exercisable during the period (x) in the case of the Tranche A Loan, commencing on the [**] anniversary of the Tranche A Closing Date and ending on the [**] anniversary of the Tranche A Closing Date, and (y) in the case of the Tranche B Loan, commencing on the [**] anniversary of the Tranche B Closing Date and ending on the [**] anniversary of the Tranche B Closing Date, by written notice to the Collateral Agent and each Lender, together with a certificate signed by a Responsible Officer of Borrower certifying as to the satisfaction of the Optional Amortization Condition and [**] in form and substance reasonably satisfactory to the Required Lenders (collectively, a “**Delayed Amortization Notice**”), to make equal quarterly payments of principal of such Term Loan commencing on the Payment Date immediately following the 48th-month anniversary of the applicable Closing Date and continuing through the Term Loan Maturity Date, provided, that if any such day is not a Business Day, the applicable payment shall be due and payable on the first Business Day immediately following such Payment Date.

(iii) Notwithstanding clauses (i) and (ii) of this clause (b), with respect to each Term Loan, as applicable, in connection with a decrease in the Term Loan Maturity Date and scheduled amortization of such Term Loan pursuant to Section 5.7(c), each of the then outstanding Payment Dates on which quarterly payments of principal of such Term Loan are payable shall be reduced by the number of days equal to the Amortization Reduction Days in accordance with Section 5.7(c) hereof.

(iv) All unpaid principal with respect to the Term Loans is due and payable in full on the Term Loan Maturity Date. The Term Loans may be prepaid only in accordance with Section 2.2(c), except as provided in Section 8.1.

(c) Prepayment of Term Loans.

(i) Borrower shall have the option, at any time after the Tranche A Closing Date, to prepay, in whole or in part (in multiples of not less than \$[**] or such lesser amount as may then be outstanding), the Term Loans advanced by Lenders under this Agreement; provided that (A) Borrower provides written notice to the Collateral Agent of its election (which shall be irrevocable unless the Collateral Agent otherwise consents in writing) to prepay all or the applicable portion of the Term Loans, which such notice shall include the amount of the Term Loans to be prepaid, at least [**] Business Days prior to such prepayment, and (B) such prepayment shall be accompanied by any and all accrued and unpaid interest on the aggregate principal amount to be prepaid to the date of prepayment and any amounts payable solely with respect to the prepayment of such principal amount under this Section 2.2(c)(i) pursuant to Section 2.2(e) or Section 2.2(f) (as applicable), and, in the case of a prepayment in whole of the Term Loans, all other amounts payable or accrued and not yet paid under this Agreement and the other Loan Documents. The Collateral Agent will promptly notify each Lender of its receipt of such notice, and the amount of such Lender’s Applicable Percentage of such prepayment.

(ii) Upon a Change in Control, Borrower shall promptly, and in any event no later than [**] after the consummation of such Change in Control, notify the Collateral Agent in writing of the occurrence of a Change in Control, which notice shall include [**] (such notice, a “**Change in Control Notice**”). Borrower shall prepay in full all of the Term Loans advanced by Lenders under this Agreement, no later than [**] after delivery to the Collateral Agent of the Change in Control Notice, in an amount equal to the sum of (A) all unpaid principal and any and all accrued and unpaid interest with respect to the Term Loans (or such remaining outstanding portion thereof), and (B) any applicable amounts payable with respect to the prepayment under this Section 2.2(c)(ii) pursuant to Section 2.2(e) or Section 2.2(f) and all other amounts payable or accrued and not yet paid under this Agreement and the other Loan Documents. The Collateral Agent will promptly notify each Lender of its receipt of the Change in Control Notice, and the amount of such Lender’s Applicable Percentage of such prepayment.

(d) Prepayment Application. Any prepayment of the Term Loans pursuant to Section 2.2(c) (together with the accompanying Makewhole Amount or Prepayment Premium that is payable pursuant to Section 2.2(e) or Section 2.2(f), as applicable) shall be paid to Lenders in accordance with their respective Applicable Percentages for application to the Obligations in the following order: [**].

(e) Makewhole Amount.

(i) Any prepayment of the Tranche A Loan by Borrower (A) pursuant to Section 2.2(c)(i) or Section 2.2(c)(ii), or (B) as a result of the acceleration of the maturity of the Term Loans pursuant to Section 8.1(a), in each case occurring prior to the 2nd-year anniversary of the Tranche A Closing Date shall, in any such case, be accompanied by payment of an amount equal to the Tranche A Makewhole Amount.

(ii) Any prepayment of the Tranche B Loan by Borrower (A) pursuant to Section 2.2(c)(i) or Section 2.2(c)(ii), or (B) as a result of the acceleration of the maturity of the Term Loans pursuant to Section 8.1(a), in each case occurring prior to the 2nd-year anniversary of the Tranche B Closing Date shall, in any such case, be accompanied by payment of an amount equal to the Tranche B Makewhole Amount.

(f) Prepayment Premium.

(i) Any prepayment of the Tranche A Loan by Borrower (A) pursuant to Section 2.2(c)(i) or Section 2.2(c)(ii), or (B) as a result of the acceleration of the maturity of the Term Loans pursuant to Section 8.1(a), shall, in any such case, be accompanied by payment of an amount equal to the Tranche A Prepayment Premium.

(ii) Any prepayment of the Tranche B Loan by Borrower (A) pursuant to Section 2.2(c)(i) or Section 2.2(c)(ii), or (B) as a result of the acceleration of the maturity of the Term Loans pursuant to Section 8.1(a), shall, in any such case, be accompanied by payment of an amount equal to the Tranche B Prepayment Premium.

2.3. **Payment of Interest on the Credit Extensions.**

(a) Interest Rate.

(i) Subject to Section 2.3(b), the principal amount outstanding under each Term Loan shall accrue interest at a per annum rate equal to the LIBOR Rate plus seven and one-half percent (7.50%) per annum (the “**Term Loan Rate**”), which interest shall be payable quarterly in arrears in accordance with this Section 2.3.

(ii) Interest shall accrue on each Term Loan commencing on, and including, the day on which such Term Loan is made, and shall accrue on such Term Loan, or any portion thereof, for the day on which such Term Loan or such portion is paid.

(b) Default Rate. In the event Borrower fails to pay any of the Obligations when due or upon the commencement and during the continuance of an Insolvency Proceeding of the Borrower (or, at the election of the Lender, upon the occurrence and during the continuance of any other Event of Default), immediately (and without notice to Borrower or demand by the Collateral Agent or any Lender for payment thereof), such Obligations shall bear interest at a rate per annum which is [**] above the rate that is otherwise applicable thereto (the “**Default Rate**”), and, with respect to past due Obligations, if any, such interest shall be payable entirely in cash on demand of the Collateral Agent or any Lender. Payment or acceptance of the increased interest rate provided in this Section 2.3(b) is not a permitted alternative to timely payment and shall not constitute a waiver of any Event of Default or otherwise prejudice or limit any rights or remedies of the Collateral Agent or any Lender.

(c) 360-Day Year. Interest shall be computed on the basis of a year of 360 days and the actual number of days elapsed.

(d) Payments. Except as otherwise expressly provided herein, all loan payments and any other payments hereunder by (or on behalf of) Borrower shall be made on the date specified herein to such bank account of each Lender as such Lender (or the Collateral Agent) shall have designated in a written notice to Borrower delivered on or before the Tranche A Closing Date (which such notice may be updated by such Lender (or the Collateral Agent) from time to time after the Tranche A Closing Date). Interest is payable quarterly on the Interest Date of each calendar quarter. Payments of principal or interest received after [**] on such date are considered received at the opening of business on the next Business Day. When any payment is due on a day that is not a Business Day, such payment is due the immediately next Business Day and additional fees or interest, as applicable, shall continue to accrue until paid. All payments to be made by Borrower hereunder or under any other Loan Document, including payments of principal and interest made hereunder and pursuant to any other Loan Document, and all fees, expenses, indemnities and reimbursements, shall be made without set-off, recoupment or counterclaim, in lawful money of the United States and in immediately available funds.

(e) If at any time the Collateral Agent determines (which determination shall be conclusive absent manifest error) that (i) adequate and reasonable means do not exist for determining the rate described in clause (a) of the definition of “LIBOR Rate” and such circumstances are unlikely to be temporary or (ii) the circumstances set forth in the immediately preceding clause (i) have not arisen but the supervisor for the administrator of the three-month LIBOR Rate or a Governmental Authority having jurisdiction over any Lender has made a public statement identifying a specific date after which the three-month LIBOR Rate shall no longer be used for determining interest rates for loans, then Lenders (or the Collateral Agent on their behalf) and Borrower shall in good faith establish an alternate rate of interest to the three-month LIBOR Rate that gives due consideration to the then prevailing market convention for determining a rate of interest for loans in the United States at such time, and shall enter into an amendment to this Agreement to reflect such alternate rate of interest and such other related changes to this Agreement as may be applicable.

2.4. Expenses. [**]

2.5. Requirements of Law; Increased Costs. In the event that any applicable Change in Law:

(a) Does or shall subject any Lender to any Tax with respect to this Agreement or the Term Loans made hereunder (except, in each case, Indemnified Taxes, Taxes described in clause (b) through (d) of the definition of Excluded Taxes, and Connection Income Taxes);

(b) Does or shall impose, modify or hold applicable any reserve, capital requirement, special deposit, compulsory loan, insurance charge or similar requirements against assets held by, or deposits or other liabilities in or for the account of, advances or loans by, or other credit extended by, or any other acquisition of funds by, any Lender; or

(c) Does or shall impose on any Lender any other condition (other than Taxes); and the result of any of the foregoing is to increase the cost to such Lender (as determined by such Lender in good faith using calculation methods customary in the industry) of making, renewing or maintaining the Term Loans or to reduce any amount receivable in respect thereof or to reduce the rate of return on the capital of such Lender or any Person controlling such Lender,

then, in any such case, Borrower shall [**] (with a copy of such certificate to the Collateral Agent) shall be conclusive in the absence of manifest error. The provisions hereof shall survive the termination of this Agreement and the payment of the outstanding Term Loans and all other Obligations. [**]; provided, further, that if the Change in Law giving rise to such increased costs or reductions is retroactive, then the [**] referred to above shall be extended to include the period of retroactive effect thereof.

2.6. Taxes; Withholding, Etc.

(a) All sums payable by any Credit Party hereunder and under the other Loan Documents shall (except to the extent required by Requirements of Law) be paid free and clear of, and without any deduction or withholding on account of, any Tax imposed, levied, collected, withheld or assessed by any Governmental Authority. In addition, Borrower agrees to pay, and shall indemnify and hold each Lender harmless from, Other Taxes, and as soon as practicable after the date of paying such sum, Borrower shall furnish to each Lender (as applicable, with a copy to the Collateral Agent) the original or a certified copy of a receipt evidencing payment thereof or other evidence reasonably satisfactory to the Collateral Agent of such payment and of the remittance thereof to the relevant taxing or other Governmental Authority.

(b) If any Credit Party or any other Person (“**Withholding Agent**”) is required by Requirements of Law to make any deduction or withholding on account of any Tax (as determined in the good faith discretion of an applicable Withholding Agent) from any sum paid or payable by any Credit Party to any Lender under any of the Loan Documents: (i) the applicable Withholding Agent shall notify the Collateral Agent of any such requirement or any change in any such requirement promptly after the applicable Withholding Agent becomes aware of it; (ii) the applicable Withholding Agent shall make any such withholding or deduction; (iii) the applicable Withholding Agent shall pay any such Tax before the date on which penalties attach thereto in accordance with Requirements of Law; (iv) if the Tax is an Indemnified Tax, the sum payable by such Credit Party in respect of which the relevant deduction, withholding or payment of Indemnified Tax is required shall be increased to the extent necessary to ensure that, after the making of that deduction, withholding or payment (including any deductions for Indemnified Taxes applicable to additional sums payable under this Section 2.6(b)), such Lender receives on the due date a net sum equal to what it would have received had no such deduction, withholding or payment of Indemnified Tax been required or made; and (v) as soon as practicable after paying any sum from which it is required by Requirements of Law to make any deduction or withholding, Borrower shall deliver to such Lender (with a copy to the Collateral Agent) the original or a certified copy of a receipt evidencing payment thereof or other evidence reasonably satisfactory to the Collateral Agent of such deduction, withholding or payment and of the remittance thereof to the relevant taxing or other Governmental Authority.

(c) Borrower shall indemnify each Lender for the full amount of any Indemnified Taxes (including Indemnified Taxes imposed or asserted on or attributable to amounts payable under this Section 2.6(c)) paid by such Lender and any liability (including any reasonable expenses) arising therefrom or with respect thereto whether or not such Indemnified Taxes were correctly or legally imposed or asserted by the relevant Governmental Authority. Any indemnification payment pursuant to this Section 2.6(c) shall be made to the applicable Lender within thirty (30) days from written demand therefor.

(d) Any Lender that is entitled to an exemption from or reduction of withholding Tax with respect to payments made under any Loan Document shall deliver to Borrower, at the time or times reasonably requested by Borrower, such properly completed and executed documentation reasonably requested by Borrower as will permit such payments to be made without withholding or at a reduced rate of withholding. In addition, such Lender, if reasonably requested by Borrower, shall deliver such other documentation prescribed by applicable law or reasonably requested by Borrower as will enable Borrower to determine whether or not such Lender is subject to backup withholding or information reporting requirements. Notwithstanding anything to the contrary in the preceding two sentences, the completion,

execution and submission of such documentation (other than such documentation set forth in Section 2.6(d)(i), (ii) or (iv) below) shall not be required if in such Lender's reasonable judgment such completion, execution or submission would subject such Lender to any material unreimbursed cost or expense or would materially prejudice the legal or commercial position of such Lender. For avoidance of doubt, for the purposes of this Section 2.6(d), the term "Lender" shall include each applicable assignee. Without limiting the generality of the foregoing:

(i) If any Lender is organized under the laws of the United States of America or any state thereof, such Lender shall deliver to Borrower two (2) executed copies of Internal Revenue Service ("IRS") Form W-9 certifying that such Lender is exempt from U.S. federal backup withholding tax.

(ii) If any Lender is a Foreign Lender, such Lender shall deliver, and shall cause each applicable assignee thereof to deliver, to Borrower, on or prior to, the Tranche A Closing Date and, the date on which a Lender Transfer involving such Lender occurs, as applicable, and at such other times as may be necessary in the determination of Borrower (in the reasonable exercise of its discretion):

(1) in the case of a Foreign Lender claiming the benefits of an income tax treaty to which the United States is a party (x) with respect to payments of interest under any Loan Document, a properly completed and duly executed copy of IRS Form W-8BEN or IRS Form W-8BEN-E establishing an exemption from, or reduction of, U.S. federal withholding Tax pursuant to the "interest" article of such tax treaty and (y) with respect to any other applicable payments under any Loan Document, a properly completed and duly executed copy of IRS Form W-8BEN or IRS Form W-8BEN-E establishing an exemption from, or reduction of, U.S. federal withholding Tax pursuant to the "business profits" or "other income" article of such tax treaty;

(2) a completed and duly executed copy of IRS Form W-8ECI;

(3) to the extent that such Foreign Lender is not the beneficial owner, a properly completed and duly executed copy of IRS W-8IMY and a withholding statement, along with IRS Form W-9, W-8BEN-E, W-8BEN, W-8ECI and/or other certification documents from each beneficial owner, as applicable; provided that if the Foreign Lender is a partnership and one or more direct or indirect partners of such Foreign Lender are claiming the portfolio interest exemption, such Foreign Lender may provide a certificate referenced in Section 2.6(d)(ii)(4) below on behalf of each such direct and indirect partner; or

(4) in the case of a Foreign Lender claiming the benefits of the exemption for "portfolio interest" under Section 881(c) of the IRC, it shall provide Borrower with a properly completed and duly executed copy of IRS Form W-8BEN-E or IRS Form W-8BEN, as applicable, and a certificate reasonably satisfactory to Borrower to the effect that any interest received by such Foreign Lender is not received by a "bank" on "extension of credit made pursuant to a loan agreement entered into in the ordinary course of its trade or business" within the meaning of 881(c)(3)(A) of the IRC, a "10 percent shareholder" of Borrower within the meaning of Section 871(h)(3)(B) of the IRC, or a "controlled foreign corporation" related to Borrower as described in Section 881(c)(3)(C) of the IRC.

(iii) If any Lender is a Foreign Lender it shall, to the extent it is legally entitled to do so, deliver to Borrower (in such number of copies as shall be requested by the recipient) on or prior to the date on which such its becomes a party to this Agreement (and from time to time thereafter upon the reasonable request of Borrower), executed copies of any other form prescribed by applicable law as a basis for claiming exemption from or a reduction in U.S. federal withholding Tax, duly completed, together with such supplementary documentation as may be prescribed by applicable law to permit Borrower to determine the withholding or deduction required to be made.

(iv) If a payment made to any Lender under any Loan Document would be subject to U.S. federal withholding Tax imposed by FATCA if such Lender were to fail to comply with the applicable reporting requirements of FATCA (including those contained in Section 1471(b) or 1472(b) of the IRC, as applicable), such Lender shall deliver to Borrower at the time or times prescribed by law and at such time or times reasonably requested by Borrower such documentation prescribed by applicable law (including as prescribed by Section 1471(b)(3)(C)(i) of the IRC) and such additional documentation reasonably requested by Borrower as may be necessary for Borrower to comply with their obligations under FATCA and to determine that Lender has complied with its obligations under FATCA or to determine the amount to deduct and withhold from such payment. Solely for purposes of this clause (iv), "FATCA" shall include any amendments made to FATCA after the date of this Agreement.

(v) If any Lender is required to deliver any forms, statements, certificates or other evidence with respect to United States federal Tax or backup withholding matters pursuant to this Section 2.6(d), such Lender hereby agrees, from time to time after the initial delivery by such Lender of such forms, certificates or other evidence, whenever a lapse in time, change in circumstances or law, or additional guidance by a Governmental Authority renders such forms, certificates or other evidence obsolete or inaccurate in any material respect, to promptly deliver to Borrower two (2) new original copies.

(vi) Borrower shall not be required to pay any additional amount to any Lender under Section 2.6(b) (iii) if such Lender shall have failed (1) to timely deliver to Borrower the forms, certificates or other evidence referred to in this Section 2.6(d) (each of which shall be complete, accurate and duly executed), or (2) to notify Borrower of its inability to deliver any such forms, certificates or other evidence, as the case may be; provided that, if such Lender shall have satisfied the requirements of this Section 2.6(d) on the Tranche A Closing Date (or on the date such Lender initially acquires an interest in a Term Loan), nothing in this last sentence of this Section 2.6(d) shall relieve Borrower of its obligations to pay any additional amounts pursuant to this Section 2.6 in the event that, solely as a result of any change in any Requirements of Law or any change in the interpretation, administration or application thereof by any applicable Governmental Authority, such Lender is no longer legally entitled to deliver forms, certificates or other evidence at a subsequent date establishing the fact that such Lender is not subject to withholding as described herein and in the forms, certificates or other evidence initially provided by such Lender.

(e) If any party hereto determines that it has received a refund of any Taxes or a credit or offset for any Taxes as to which it has been indemnified pursuant to this Section 2.6 (including by the payment of additional amounts pursuant to this Section 2.6), it shall pay to the indemnifying party an amount equal to such refund, credit or offset (but only to the extent of indemnity payments made, or additional amounts paid, under this Section 2.6 with respect to the Taxes giving rise to such refund), net of all out-of-pocket expenses (including Taxes) of such indemnified party and without interest (other than any interest paid by the relevant Governmental Authority with respect to such refund). Such indemnifying party, upon the request of such indemnified party, shall repay to such indemnified party the amount paid over pursuant to this clause (e) in the event that such indemnified party is required to repay, credit or offset such refund to such Governmental Authority and the requirement to repay such refund to such Governmental Authority is not due to the indemnified party's failure to timely provide complete and accurate IRS forms and other documentation required pursuant to Section 2.6(d) or Section 2.8. Notwithstanding anything to the contrary in this clause (e), in no event will the indemnified party be required to pay any amount to an indemnifying party pursuant to this clause (e) if the payment of such amount would place the indemnified party in a less favorable net after-Tax position than the indemnified party would have been in if the indemnification payments or additional amounts giving rise to such refund had not been deducted, withheld or otherwise imposed and the indemnification payments or additional amounts with respect to such tax had never been paid. This clause (e) shall not be construed to require any indemnified party to make available its Tax returns (or any other information relating to its Taxes that it deems confidential) to the indemnifying party or any other Person.

2.7. **Additional Consideration.** As additional consideration for the obligation to make the Term Loans and the making of the Term Loans, on the Tranche A Closing Date, Borrower shall pay to each Lender an amount equal to such Lender's Applicable Percentage of the product of (i) the sum of the Tranche A Loan plus the Tranche B Loan Amount, multiplied by (ii) two percent (2.0%) (each such product, the "**Additional Consideration**"). The Additional Consideration shall be fully earned when paid and shall not be refundable for any reason whatsoever and such Additional Consideration shall be treated as original issue discount for U.S. federal income tax purposes.

2.8. **Evidence of Debt; Register; Collateral Agent's Books and Records; Term Loan Notes.**

Evidence of Debt; Register. Notwithstanding anything herein to the contrary, Borrower hereby designates the Collateral Agent to serve as Borrower's agent solely for purposes of maintaining at all times at the Collateral Agent's principal office a "book entry system" as described in Treasury Regulations Section 5f.103-1(c)(1)(ii) that identifies each beneficial owner that is entitled to a payment of principal and stated interest on each Term Loan (the "**Register**") so that each Term Loan is at all times in "registered form" as described in IRC Treasury Regulations Section 5f.103-1(c) or Proposed Section 1.163-5(b) (or, in each case, any amended or successor version). The Collateral Agent is hereby authorized by Borrower to record in the manual or data processing records of the Collateral Agent, the date and amount of each advance and the amount of the outstanding Obligations and the date and amount of each repayment of principal and each payment of interest or otherwise on account of the Obligations. Absent manifest error, such records of the Collateral Agent shall be conclusive as to the outstanding principal amount of the total outstanding Obligations, and the payment of interest, principal and other sums due hereunder; provided, however, that the failure of the Collateral Agent to make any such record entry with respect to any payment shall not limit or otherwise affect the obligations of Borrower under the Loan Documents. Each Term Loan: (i) shall, pursuant to this clause (a), be also registered as to both principal and any stated interest with Borrower or its agent, and (ii) may be transferred by any Lender only by (1) surrender of the old instrument and either (x) the reissuance by Borrower of the old instrument to the new Lender or (y) the issuance by Borrower of a new instrument to the new Lender, or (2) confirmation with Borrower that the right to the principal and stated interest on such Term Loan is maintained through the book entry system kept by the Collateral Agent. Each Lender, severally and not jointly, represents that any interest that may become due and owing under this Agreement qualifies for the portfolio interest exception from withholding on interest payments pursuant to IRC Sections 871(h) and 881(c).

Term Loan Notes. Borrower shall execute and deliver to each Lender to evidence such Lender's Term Loans, (i) within two (2) Business Days of the Tranche A Closing Date, the Tranche A Note and (ii) within two (2) Business Days of the Tranche B Closing Date, the Tranche B Note (each, a "**Term Loan Note**").

3. **CONDITIONS OF TERM LOANS**

3.1. **Conditions Precedent to Tranche A Loan.** Each Lender's obligation to advance its Applicable Percentage of the Tranche A Loan Amount is subject to the satisfaction (or waiver in accordance with Section 11.5 hereof) of the following conditions:

(a) The Collateral Agent's and each Lender's receipt of copies of the Loan Documents (including the Tranche A Note, executed by Borrower, and the Collateral Documents but excluding any Control Agreements and any other Loan Document described in Schedule 5.14 of the Disclosure Letter to be delivered after the Tranche A Closing Date) executed and delivered by each applicable Credit Party, the Disclosure Letter, if and to the extent any update thereto is necessary between the Effective Date and the Closing Date (provided, that in no event may the Disclosure Letter be updated in a manner that would reflect or evidence a Default or Event of Default (with or without such update)) and each other schedule to such Loan Documents (the Disclosure Letter and such other schedules to be in form and substance reasonably satisfactory to the Collateral Agent);

(b) The Collateral Agent's receipt of (i) true, correct and complete copies of the Operating Documents of each of the Credit Parties, and (ii) an Officer's Certificate, dated the Tranche A Closing Date, certifying that the foregoing copies are true, correct and complete (such Officer's Certificate to be in form and substance reasonably satisfactory to the Collateral Agent);

(c) The Collateral Agent's receipt of the Perfection Certificate for Borrower and its Subsidiaries, in form and substance reasonably satisfactory to the Collateral Agent, if and to the extent any

update thereto is necessary between the Effective Date and the Tranche A Closing Date (provided, that in no event may the Perfection Certificate be updated in a manner that would reflect or evidence a Default or an Event of Default (with or without such update));

(d) The Collateral Agent's receipt of a good standing certificate for each Credit Party (where applicable), certified by the Secretary of State (or the equivalent thereof) of the jurisdiction of incorporation or formation of such Credit Party as of a date no earlier than [**] prior to the Tranche A Closing Date;

(e) The Collateral Agent's receipt of an Officer's Certificate with completed Borrowing Resolutions with respect to the Loan Documents and the Tranche A Loan for each Credit Party, in form and substance reasonably satisfactory to the Collateral Agent;

(f) each Credit Party shall have obtained all Governmental Approvals and all consents of other Persons, if any, in each case that are necessary in connection with the transactions contemplated by the Loan Documents and each of the foregoing shall be in full force and effect and in form and substance reasonably satisfactory to the Collateral Agent;

(g) The Collateral Agent's receipt on the Tranche A Closing Date of an opinion of Latham & Watkins LLP, counsel to all of the Credit Parties, addressed to the Collateral Agent and each Lender, in form and substance reasonably satisfactory to the Collateral Agent;

(h) The Collateral Agent's receipt of (i) evidence that the [**] maintained regarding any Collateral are in full force and effect and (ii) appropriate evidence showing [**] to the extent required by Section 5.4;

(i) The Collateral Agent's receipt of all documentation and other information required by bank regulatory authorities under applicable "know-your-customer" and anti-money laundering rules and regulations, including the U.S.A. Patriot Act (Title III of Pub. L. 107-56 (signed into law October 26, 2001)) (the "**Patriot Act**");

(j) [Reserved];

(k) [**];

(l) The Collateral Agent's receipt of a certificate, dated the Tranche A Closing Date and signed by a Responsible Officer of Borrower, confirming [**], except as set forth on Schedule 4.7 of the Disclosure Letter (such certificate to be in form and substance reasonably satisfactory to the Collateral Agent); and

(m) The Collateral Agent's receipt of a certificate, dated the Tranche A Closing Date and signed by a Responsible Officer of Borrower, confirming satisfaction of the conditions precedent set forth in this Section 3.1 and in Section 3.3 and Section 3.5 (such certificate to be in form and substance reasonably satisfactory to the Collateral Agent).

Collateral Agent and each Lender acknowledge and agree that (x) the form of deliverables set forth in clauses [**] above and clauses [**] above have been received on the Effective Date and are satisfactory to Collateral Agent and Lenders (subject to the provisos set forth in clauses [**] and [**] [**]) and (y) the form of deliverables set forth in clauses [**] and [**] above provided to Collateral Agent and Lenders on the Effective Date are satisfactory to Collateral Agent and Lenders, provided that, in the case of both clause [**] and [**] above, no changes are made thereto between the Effective Date and the Tranche A Closing Date (subject to the provisos set forth in clauses [**] and [**] above regarding updates to the Disclosure Letter and Perfection Certificate).

In the event the Lenders fail to advance the Tranche A Loan Amount in full or the Tranche A Closing Date otherwise fails to occur on or prior to November 25, 2019, this Agreement and all other Loan Documents shall automatically terminate and Collateral Agent and the Lenders shall release any Liens (if any) in accordance with Section 12.8.

3.2. Conditions Precedent to Tranche B Loan. Each Lender's obligation to advance its Applicable Percentage of the Tranche B Loan Amount is subject to the satisfaction (or waiver in accordance with Section 11.5 hereof) of the following conditions:

(a) Each Lender's receipt of the Tranche B Note, executed by Borrower, and the Collateral Agent's and such Lender's receipt of an updated Disclosure Letter, if and to the extent any update thereto is necessary between the Tranche A Closing Date and the Tranche B Closing Date (provided, that in no event may the Disclosure Letter be updated in a manner that would reflect or evidence a Default or Event of Default (with or without such update)) (to be in form and substance reasonably satisfactory to the Collateral Agent);

(b) The Collateral Agent's receipt of an updated Perfection Certificate for Borrower and its Subsidiaries, if and to the extent any update thereto is necessary between the Tranche A Closing Date and the Tranche B Closing Date (provided, that in no event may the Perfection Certificate be updated in a manner that would reflect or evidence a Default or an Event of Default (with or without such update)) (to be in form and substance reasonably satisfactory to the Collateral Agent);

(c) [**];

(d) [**];

(e) [**];

(f) The Collateral Agent's receipt of a certificate, dated the Tranche B Closing Date and signed by a Responsible Officer of Borrower, confirming there is no Adverse Proceeding pending or, to the Knowledge of Borrower, threatened, that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change, except as set forth on Schedule 4.7 of the Disclosure Letter delivered in accordance with Section 3.1(k) or, to the extent updated, clause (a) above (such certificate to be in form and substance reasonably satisfactory to the Collateral Agent) or advised in writing by Borrower at any time prior to the delivery of Payment/Advance Form for the Tranche B Loan; and

(g) The Collateral Agent's receipt of a certificate, dated the Tranche B Closing Date and signed by a Responsible Officer of Borrower, confirming satisfaction of the conditions precedent set forth in this Section 3.2 and in Section 3.4 and Section 3.5 (such certificate to be in form and substance reasonably satisfactory to the Collateral Agent).

3.3. Additional Conditions Precedent to Term Loans. The obligation of each Lender to advance its Applicable Percentage of each Term Loan is subject to the following additional conditions precedent:

(a) the representations and warranties made by the Credit Parties in Section 4 of this Agreement and in the other Loan Documents are true and correct in all material respects, unless any such representation or warranty is stated to relate to a specific earlier date, in which case such representation or warranty shall be true and correct in all material respects as of such earlier date (it being understood that any representation or warranty that is qualified as to "materiality," "Material Adverse Change," or similar language shall be true and correct in all respects, in each case, on the Closing Date (both with and without giving effect to the Term Loans) or as of such earlier date, as applicable); and

(b) there shall not have occurred (i) any Material Adverse Change or (ii) any Default or Event of Default.

3.4. Covenant to Deliver. The Credit Parties agree to deliver to the Collateral Agent or each Lender, as applicable, each item required to be delivered to Collateral Agent or each Lender, as applicable, under this Agreement as a condition precedent to any Credit Extension; provided, however, that any such items set forth on Schedule 5.14 of the Disclosure Letter shall be delivered to the Collateral Agent within the time period prescribed therefor on such schedule. The Credit Parties expressly agree that a Credit Extension made prior to the receipt by the Collateral Agent or any Lender, as applicable, of any such item shall not constitute a waiver by the Collateral Agent or any Lender of the Credit Parties' obligation to deliver such item, and the making of any Credit Extension in the absence of any such item required to have been delivered by the date of such Credit Extension shall be in the applicable Lender's sole discretion.

3.5. Procedures for Borrowing. Subject to the prior satisfaction of all other applicable conditions to the making of each Term Loan set forth in this Agreement, to obtain any Term Loan, Borrower shall deliver to the Collateral Agent and Lenders by electronic mail or facsimile a completed Payment/Advance Form in the form of Exhibit A hereto for such Term Loan executed by a Responsible Officer of Borrower (which notice shall be irrevocable on and after the date on which such notice is given and Borrower shall be bound to make a borrowing in accordance therewith), in which case each Lender agrees to advance its Applicable Percentage of such Term Loan to Borrower on the Tranche A Closing Date or Tranche B Closing Date, as applicable, by wire transfer of same day funds in Dollars, to such account(s) in the United States as may be designated in writing to the Collateral Agent by Borrower prior to the Tranche A Closing Date or Tranche B Closing Date, as applicable; provided, however, that with respect to the Tranche B Loan, Borrower shall deliver to the Collateral Agent and Lenders by electronic mail or facsimile, at its option should it wish to obtain the Tranche B Loan, such completed Payment/Advance Form on such date that is at least [**] (or such shorter period as may be agreed to by Lenders) prior to the Tranche B Closing Date set forth in such notice.

4. REPRESENTATIONS AND WARRANTIES

In order to induce each Lender and the Collateral Agent to enter into this Agreement and for each Lender to make the Credit Extensions to be made on the Closing Date, each Credit Party, jointly and severally, represents and warrants to each Lender and the Collateral Agent that: (x) all of the following statements are true and correct as of the Effective Date and on the Tranche A Closing Date (both with and without giving effect to the Tranche A Loan) and [**]:

4.1. Due Organization, Power and Authority. Each of Borrower and each of its Subsidiaries: (a) is duly incorporated, organized or formed, and validly existing and, where applicable, in good standing under the laws of its jurisdiction of incorporation, organization or formation identified on Schedule 4.15 of the Disclosure Letter; (b) has all requisite power and authority to (i) own, lease, license and operate its assets and properties and to carry on its business as currently conducted in the ordinary course of business and (ii) execute and deliver the Loan Documents to which it is a party and to perform its obligations thereunder and otherwise carry out the transactions contemplated thereby; (c) is duly qualified and, where applicable, in good standing under the laws of each jurisdiction where its ownership, lease, license or operation of assets or properties or the conduct of its business requires such qualification; and (d) has all requisite Governmental Approvals to operate its business as currently conducted; except in each case referred to clauses (a) (other than with respect to Borrower and any other Credit Party), (b)(i), (c) or (d) above, to the extent that failure to do so could not, individually or in the aggregate, reasonably be expected to result in a Material Adverse Change.

4.2. Equity Interests. All of the outstanding Equity Interests in each Subsidiary of the Borrower, the Equity Interests of which are required to be pledged pursuant to the Collateral Documents, have been duly authorized and validly issued, are fully paid and, in the case of Equity Interests representing corporate interests, are non-assessable and, on the Closing Date, all such Equity Interests owned directly by Borrower or any other Credit Party are owned free and clear of all Liens except for Permitted Liens. Schedule 4.2 of the Disclosure Letter identifies each Person, the Equity Interests of which are required to be pledged on the Closing Date pursuant to the Collateral Documents.

4.3. Authorization; No Conflict. Except as set forth on Schedule 4.3 of the Disclosure Letter, the execution, delivery and performance by each Credit Party of the Loan Documents to which it is a party, and the consummation of the transactions contemplated thereby, (a) have been duly authorized by all necessary corporate or other organizational action and (b) do not and will not (i) contravene the terms of any of such Credit Party's Operating Documents, (ii) conflict with or result in any breach or contravention of, or require any payment to be made under (A) any provision of any security issued by such Credit Party or of any agreement, instrument or other undertaking to which such Credit Party is a party or affecting such Credit Party or the assets or properties of such Credit Party or any of its Subsidiaries or (B) any order, writ, judgment, injunction, decree, determination or award of any Governmental Authority by which such Credit Party or any of its properties or assets are subject, (iii) result in the creation of any Lien (other than under the Loan Documents) or (iv) violate any Requirements of Law, except, in the cases of clauses (b)(ii) and (b)(iv) above, to the extent that such conflict, breach, contravention, payment or violation could not, individually or in the aggregate, reasonably be expected to result in a Material Adverse Change.

4.4. Government Consents; Third Party Consents. Except as set forth on Schedule 4.4 of the Disclosure Letter, no Governmental Approval or other approval, consent, exemption or authorization, or other action by, or notice to, or filing with, any Governmental Authority or any other Person (including any counterparty to any Current Company IP Agreement or other Material Contract) is necessary or required in connection with (a) the execution, delivery or performance by, or enforcement against, any Credit Party of this Agreement or any other Loan Document, or for the consummation of the transactions contemplated hereby or thereby, (b) the grant by any Credit Party of the Liens granted by it pursuant to the Collateral Documents, (c) the perfection or maintenance of the Liens created under the Collateral Documents (including the priority thereof) or (d) the exercise by the Collateral Agent or any Lender of its rights under the Loan Documents or the remedies in respect of the Collateral pursuant to the Collateral Documents, except for (i) filings necessary to perfect the Liens on the Collateral granted by the Credit Parties to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties, (ii) the approvals, consents, exemptions, authorizations, actions, notices and filings which have been duly obtained, taken, given or made and are in full force and effect, (iii) filings under state or federal securities laws and (iv) those approvals, consents, exemptions, authorizations or other actions, notices or filings, the failure of which to obtain or make could not, individually or in the aggregate, reasonably be expected to result in a Material Adverse Change.

4.5. Binding Obligation. Each Loan Document has been duly executed and delivered by each Credit Party that is a party thereto and constitutes a legal, valid and binding obligation of such Credit Party, enforceable against such Credit Party in accordance with its respective terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws relating to or limiting creditors' rights generally or by general principles of equity.

4.6. Collateral. In connection with this Agreement, each Credit Party has delivered to the Collateral Agent a completed certificate signed by such Credit Party (with respect to all Credit Parties, collectively, the "**Perfection Certificate**"). Each Credit Party, jointly and severally, represents and warrants to the Collateral Agent and each Lender:

(a) (i) its exact legal name is that indicated on the Perfection Certificate and on the signature page hereof; (ii) it is an organization of the type and is organized in the jurisdiction set forth in the Perfection Certificate; (iii) the Perfection Certificate accurately sets forth its organizational identification number or accurately states that it has none; (iv) the Perfection Certificate accurately sets forth as of the Closing Date its place of business, or, if more than one, its chief executive office as well as its mailing address (if different than its chief executive office); (v) it (and each of its predecessors) has not, in the **[**]** prior to the Closing Date, changed its jurisdiction of formation, organizational structure or type, or any organizational number assigned by its jurisdiction; and (vi) all other information set forth on the Perfection Certificate pertaining to it and each of its Subsidiaries is accurate and complete in all material respects as of the Closing Date. If any Credit Party is not now a Registered Organization but later becomes one, it shall promptly notify the Collateral Agent of such occurrence and provide the Collateral Agent with such Credit Party's organizational identification number.

(b) (i) it has good title to, has rights in, and subject to Permitted Subsidiary Distribution Restrictions, the power to transfer each item of the Collateral upon which it purports to grant a Lien under any Collateral Document, free and clear of any and all Liens except Permitted Liens, except for such minor irregularities or defects in title as could not, individually or in the aggregate, reasonably be expected to result in a Material Adverse Change and (ii) it has no deposit accounts maintained at a bank or other depository or financial institution located in the United States other than the deposit accounts described in the Perfection Certificate delivered to the Collateral Agent in connection herewith.

(c) A true, correct and complete list of each [**] (collectively, the “**Current Company IP**”), including its name/title, current owner or co-owners (including ownership interest), [**], is set forth on Schedule 4.6(c) of the Disclosure Letter. Except as set forth on Schedule 4.6(c) of the Disclosure Letter, (i) (A) each item of owned Current Company IP is valid, subsisting and enforceable and no such item of Current Company IP has lapsed, expired, been cancelled or invalidated or become abandoned or unenforceable, and (B) to the Knowledge of Borrower, no written notice has been received challenging the inventorship or ownership, or relating to any lapse, expiration, invalidation, abandonment or unenforceability, of any such item of Current Company IP, and (ii) to the Knowledge of Borrower, (A) each such item of Current Company IP which is licensed from another Person is valid, subsisting and enforceable and no such item of Current Company IP has lapsed, expired, been cancelled or invalidated, or become abandoned or unenforceable, and (B) no written notice has been received challenging the inventorship or ownership, or relating to any lapse, expiration, invalidation, abandonment or unenforceability, of any such item of Current Company IP. To the Knowledge of Borrower [**]. Except as set forth on Schedule 4.6(c) of the Disclosure Letter, (x) each Person who has or has had any rights in or to owned Current Company IP or any trade secrets owned by any Credit Party or any of its Subsidiaries, including each inventor named on the Patents within such owned Current Company IP filed by any Credit Party or any of its Subsidiaries, and has executed [**], and (y) to the Knowledge of Borrower, [**].

(d) (i) Each Credit Party or any of its Subsidiaries possesses valid title to the Current Company IP for which it is listed as the owner or co-owner, as applicable, on Schedule 4.6(c) of the Disclosure Letter; and (ii) there are no Liens on any Current Company IP, other than Permitted Liens.

(e) There are no maintenance, annuity or renewal fees that are currently overdue beyond their allotted grace period for any of the Current Company IP which is owned by or exclusively licensed to any Credit Party or any of its Subsidiaries, except, in each case, that would not reasonably be expected to have a materially adverse impact on such Credit Party’s or Subsidiary’s rights to such Current Company IP, nor have any applications or registrations therefor lapsed or become abandoned, been cancelled or expired. There are no maintenance, annuity or renewal fees that are currently overdue beyond their allotted grace period for any of the Current Company IP which is non-exclusively licensed to any Credit Party or any of its Subsidiaries, except, in each case, that would not reasonably be expected to have a materially adverse impact on such Credit Party’s or Subsidiary’s rights to such Current Company IP, nor to the Knowledge of Borrower, have any applications or registrations therefor lapsed or become abandoned, been cancelled or expired.

(f) There are no unpaid fees or royalties under any Current Company IP Agreement that have become due, or are expected to become overdue. Each Current Company IP Agreement is in full force and effect and, to the Knowledge of Borrower, is legal, valid, binding, and enforceable in accordance with its respective terms, except as may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws relating to or limiting creditors’ rights generally or by equitable principles relating to enforceability. Except as set forth on Schedule 4.6(f) of the Disclosure Letter, neither Borrower nor any of its Subsidiaries, as applicable, is in breach of or default in any manner that could reasonably be expected to materially adversely affect the Product under any Current Company IP Agreement to which it is a party or may otherwise be bound, and to the Knowledge of Borrower, no circumstances or grounds exist that would give rise to a claim of breach or right of rescission, termination, non-renewal, revision or amendment of any of the Current Company IP Agreements, including the execution, delivery and performance of this Agreement and the other Loan Documents.

(g) To the Knowledge of Borrower, no payments by any Credit Party or any of its Subsidiaries are due to any other Person in respect of the Current Company IP, other than pursuant to the Current Company IP Agreements and those fees payable to patent offices in connection with the prosecution and maintenance of the Current Company IP, any applicable taxes and associated attorney fees.

(h) No Credit Party or any of its Subsidiaries has undertaken or omitted to undertake any acts, and, to the Knowledge of Borrower, no circumstance or grounds exist that would invalidate or reduce, in whole or in part, the enforceability or scope of (i) the Current Company IP in any manner that could reasonably be expected to materially adversely affect the Product, or (ii) in the case of Current Company IP owned or co-owned or exclusively or non-exclusively licensed by any Credit Party or any of its Subsidiaries, except as set forth on Schedule 4.6(h) of the Disclosure Letter, such Credit Party's or Subsidiary's entitlement to own or license and exploit such Current Company IP.

(i) Except as set forth on Schedule 4.7 of the Disclosure Letter or advised pursuant to Section 5.2(b), there is no pending, decided or settled opposition, interference proceeding, reissue proceeding, reexamination proceeding, inter-partes review proceeding, post-grant review proceeding, cancellation proceeding, injunction, litigation, paragraph IV patent certification or lawsuit under the Hatch-Waxman Act, hearing, investigation, complaint, arbitration, mediation, demand, International Trade Commission investigation, decree, or any other dispute, disagreement, or claim, in each case alleged in writing to Borrower or any of its Subsidiaries (collectively referred to hereinafter as "**Specified Disputes**"), nor to the Knowledge of Borrower, has any such Specified Dispute been threatened in writing, in each case challenging the legality, validity, enforceability or ownership of any Current Company IP, in each case that would have a material adverse effect on the Product.

(j) [Reserved].

(k) In each case where an issued Patent within the Current Company IP is owned or co-owned by any Credit Party or any of its Subsidiaries by assignment, the assignment has been duly recorded with the U.S. Patent and Trademark Office.

(l) Except as set forth on Schedule 4.6(l) of the Disclosure Letter, there are no pending or, to the Knowledge of Borrower, threatened claims against Borrower or any of its Subsidiaries alleging (i) that any research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory infringes or violates (or in the past infringed or violated) the rights of any third parties in or to any Intellectual Property ("**Third Party IP**") or constitutes a misappropriation of (or in the past constituted a misappropriation of) any Third Party IP, or (ii) that any Current Company IP is invalid or unenforceable.

(m) Except as set forth on Schedule 4.6(m) of the Disclosure Letter, the manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory does not, to the Knowledge of Borrower, infringe or violate (or in the past infringed or violated) any issued or registered Third Party IP (including any issued Patent within the Third Party IP) or, to the Knowledge of Borrower, constitutes a misappropriation of (or in the past constituted a misappropriation of) any Third Party IP.

(n) Except as set forth on Schedule 4.6(n) of the Disclosure Letter, there are no settlements, covenants not to sue, consents, judgments, orders or similar obligations which: (i) restrict the rights of any Credit Party or any of its Subsidiaries to use any Intellectual Property relating to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory (in order to accommodate any Third Party IP or otherwise), or (ii) permit any third parties to use any Company IP.

(o) Except as set forth on Schedule 4.6(o) of the Disclosure Letter, to the Knowledge of Borrower (i) there is no, nor has there been any, infringement or violation by any Person of any of the Company IP or the rights therein, and (ii) there is no, nor has there been any, misappropriation by any Person of any of the Company IP or the subject matter thereof.

(p) Each Credit Party and each of its Subsidiaries has taken all commercially reasonable measures customary in the pharmaceutical industry to protect the confidentiality and value of all trade secrets owned by such Credit Party or any of its Subsidiaries or used or held for use by such Credit Party or any of its Subsidiaries, in each case relating to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory.

(q) [Reserved].

(r) Except as set forth on Schedule 4.6(r) of the Disclosure Letter, to the Knowledge of Borrower, at the time of any shipment of Product in the Territory occurring prior to the Effective Date, the units thereof so shipped complied with their relevant specifications and were manufactured in all material respects in accordance with current FDA Good Manufacturing Practices.

4.7. Adverse Proceedings, Compliance with Laws. Except as set forth on Schedule 4.7 of the Disclosure Letter or advised pursuant to Section 5.2(b), there are no Adverse Proceedings pending or, to the Knowledge of Borrower, threatened in writing, at law, in equity, in arbitration or before any Governmental Authority, by or against Borrower or any of its Subsidiaries or against any of their respective assets or properties or revenues that, either individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change. Neither Borrower nor any of its Subsidiaries (a) is in violation of any Requirements of Law (including Environmental Laws) except for such violations that, individually or in the aggregate, would not reasonably be expected to result in a Material Adverse Change, or (b) is subject to or in default with respect to any final judgments, orders, writs, injunctions, decrees, rules or regulations of any court or any federal, state, municipal or other governmental department, commission, board, bureau, agency or instrumentality, domestic or foreign, that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change.

4.8. Exchange Act Documents; Financial Statements; Financial Condition; No Material Adverse Change; Books and Records.

(a) The documents filed by Borrower with the SEC pursuant to the Exchange Act since January 1, 2019 (the “**Exchange Act Documents**”), when they were filed with the SEC, conformed in all material respects to the requirements of the Exchange Act, and as of the time they were filed with the SEC, none of such documents contained any untrue statement of a material fact or omitted to state a material fact necessary to make the statements therein (excluding any projections and forward-looking statements, estimates, budgets and general economic or industry data of a general nature), in the light of the circumstances under which they were made, not misleading; provided, that, with respect to [**], Borrower represents only that such information was prepared in good faith based upon assumptions believed to be reasonable at the time (it being understood that such [**] are not a guarantee of financial performance and are subject to uncertainties and contingencies, many of which are beyond the control of Borrower or any Subsidiary, and neither Borrower nor any Subsidiary can give any assurance that such [**] will be attained, that actual results may differ in a material manner from such [**] and any failure to meet such [**] shall not be deemed to be a breach of any representation or covenant herein);

(b) The financial statements (including the related notes thereto) of Borrower and its Subsidiaries included in the Exchange Act Documents present fairly in all material respects the consolidated financial condition of Borrower and such Subsidiaries and their consolidated results of operations as of the dates indicated and the results of their operations and the changes in their cash flows for the periods specified. Such financial statements have been prepared in conformity with Applicable Accounting Standards applied on a consistent basis throughout the periods covered thereby, except as otherwise disclosed therein and, in the case of unaudited, interim financial statements, subject to normal year-end audit adjustments and the exclusion of certain footnotes, and any supporting schedules included in the Exchange Act Documents present fairly in all material respects the information required to be stated therein (subject to the proviso in Section 4.8(a) above with respect to projections);

(c) Since December 31, 2018, there has not occurred or failed to occur any change or event that has had or could reasonably be expected to have, either alone or in conjunction with any other change(s), event(s) or failure(s), a Material Adverse Change, except as has been disclosed in the Exchange Act Documents; and

(d) The Books of Borrower and each of its Subsidiaries in existence immediately prior to the Effective Date contain full, true and correct entries of all dealings and transactions in relation to its business and activities in conformity with Applicable Accounting Standards and all Requirements of Law.

4.9. Solvency. Borrower and its Subsidiaries, on a consolidated basis, are Solvent. Without limiting the generality of the foregoing, there has been no proposal made or resolution adopted by any competent corporate body for the dissolution or liquidation of Borrower, nor do any circumstances exist which may result in the dissolution or liquidation of Borrower.

4.10. Payment of Taxes. All U.S. federal and state income and other material Tax returns and reports (or extensions thereof) of each Credit Party and each of its Subsidiaries required to be filed by any of them have been timely filed and correct in all material respects, and all material Taxes which are due and payable by any Credit Party or any of its Subsidiaries and all material assessments, fees and other governmental charges upon any Credit Party or any of its Subsidiaries and upon their respective properties, assets, income, businesses and franchises which are due and payable have been paid when due and payable except where the validity or amount thereof is being contested in good faith by appropriate proceedings; provided that (a) the applicable Credit Party has set aside on its books adequate reserves therefor in conformity with Applicable Accounting Standards and (b) the failure to pay such Taxes, individually or in the aggregate, could not reasonably be expected to result in a Material Adverse Change.

4.11. Environmental Matters. Neither Borrower nor any of its Subsidiaries nor any of their respective Facilities or operations is subject to any outstanding written order, consent decree or settlement agreement with any Person relating to any Environmental Law, any Environmental Claim, or any Hazardous Materials Activity that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change. There are and, to the Knowledge of Borrower, have been, no conditions, occurrences, or Hazardous Materials Activities that would reasonably be expected to form the basis of an Environmental Claim against Borrower or any of its Subsidiaries that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change. To the Knowledge of Borrower, no predecessor of Borrower or any of its Subsidiaries has filed any notice under any Environmental Law indicating past or present treatment of Hazardous Materials at any Facility, which would reasonably be expected to form the basis of an Environmental Claim against Borrower or any of its Subsidiaries that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change (but, for the avoidance of doubt, Borrower has not undertaken any investigation of or made any inquiries to, or relating to, any of its or its Subsidiaries' predecessors), and neither Borrower's nor any of its Subsidiaries' operations involves the generation, transportation, treatment, storage or disposal of hazardous waste, as defined under 40 C.F.R. Parts 260 270 or any state equivalent, which would reasonably be expected to form the basis of an Environmental Claim against Borrower or any of its Subsidiaries that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change. No event or condition has occurred or is occurring with respect to any Credit Party relating to any Environmental Law, any Release of Hazardous Materials, or any Hazardous Materials Activity that, individually or in the aggregate, has resulted in, or could reasonably be expected to result in, a Material Adverse Change.

4.12. Material Contracts. After giving effect to the consummation of the transactions contemplated by this Agreement, except as described on Schedule 4.12 of the Disclosure Letter, each Material Contract is a valid and binding obligation of the applicable Credit Party and, to the Knowledge of Borrower, each other party thereto, and is in full force and effect, and neither the applicable Credit Party nor, to the Knowledge of Borrower, any other party thereto is in material breach thereof or default thereunder, except where such breach or default (which default has not been cured or waived) could not reasonably be expected to give rise to any cancellation, termination or acceleration right of the applicable counterparty thereto or result in the invalidation thereof. No Credit Party or any of its Subsidiaries has received any written notice from any party thereto asserting or, to the Knowledge of Borrower threatening to assert, circumstances that could reasonably be expected to result in the cancellation, termination or invalidation of any Material Contract or the acceleration of such Credit Party's or Subsidiary's obligations thereunder.

4.13. Regulatory Compliance. No Credit Party is or is required to be, or is a company “controlled” by, an “investment company” as defined in, or is subject to regulation under, the Investment Company Act of 1940, as amended. Each Credit Party has complied in all material respects with the Federal Fair Labor Standards Act. Except as could not, either individually or in the aggregate, reasonably be expected to result in a Material Adverse Change, each Plan is in compliance with the applicable provisions of ERISA, the IRC and other U.S. federal or state Requirements of Law, respectively. (a) No ERISA Event has occurred or is reasonably expected to occur; (b) neither any Credit Party nor any ERISA Affiliate has incurred, or reasonably expects to incur, any liability (and no event has occurred which, with the giving of notice under Section 4219 of ERISA, would result in such liability) under Section 4201 *et seq.* or 4243 of ERISA with respect to a Multiemployer Plan; and (c) neither any Credit Party nor any ERISA Affiliate has engaged in a transaction that would be subject to Section 4069 or 4212(c) of ERISA, except, with respect to each of clauses (a), (b) and (c) above, as could not reasonably be expected, individually or in the aggregate, to result in a Material Adverse Change.

4.14. Margin Stock. No Credit Party is engaged principally, or as one of its important activities, in extending credit for the purpose of, whether immediate or ultimate, of purchasing or carrying Margin Stock. No Credit Party owns any Margin Stock. No Credit Party or any of its Subsidiaries has taken or permitted to be taken any action that might cause any Loan Document to violate Regulation T, U or X of the Federal Reserve Board.

4.15. Subsidiaries. Schedule 4.15 of the Disclosure Letter (a) sets forth the name and jurisdiction of incorporation, organization or formation of Borrower and each of its Subsidiaries and (b) sets forth the ownership interest of Borrower and any other Credit Party in each of their respective Subsidiaries, including the percentage of such ownership.

4.16. Employee Matters. Neither Borrower nor any of its Subsidiaries is engaged in any unfair labor practice that could reasonably be expected to result in a Material Adverse Change. There is (a) no unfair labor practice complaint pending against Borrower or any of its Subsidiaries or, to the Knowledge of Borrower, threatened in writing against any of them before the National Labor Relations Board, and no grievance or arbitration proceeding arising out of or under any collective bargaining agreement that is pending against Borrower or any of its Subsidiaries or, to the Knowledge of Borrower, threatened in writing against any of them, (b) no strike or work stoppage in existence or, to the Knowledge of Borrower, threatened in writing involving Borrower or any of its Subsidiaries, and (c) to the Knowledge of Borrower, no union representation question existing with respect to the employees of Borrower or any of its Subsidiaries and, to the Knowledge of Borrower, no union organization activity that is taking place that in each case specified in any of clauses (a), (b) and (c), individually or taken together with any other matter specified in clause (a), (b) or (c), could reasonably be expected to result in a Material Adverse Change.

4.17. Full Disclosure. None of the documents, certificates or written statements (excluding any projections and forward-looking statements, estimates, budgets and general economic or industry data of a general nature) furnished or otherwise made available to the Collateral Agent or any Lender by or on behalf of any Credit Party for use in connection with the transactions contemplated hereby (in each case, taken as a whole and as modified or supplemented by other information so furnished promptly after the same becomes available) contains any untrue statement of a material fact or omits to state a material fact necessary in order to make the statements contained herein or therein, as of the time when made or delivered, not misleading in light of the circumstances in which the same were made; provided, that, with respect to **[**]**, Borrower represents only that such information was prepared in good faith based upon assumptions believed to be reasonable at the time (it being understood that such **[**]** are not a guarantee of financial performance and are subject to uncertainties and contingencies, many of which are beyond the control of Borrower or any Subsidiary, and neither Borrower nor any Subsidiary can give any assurance that such **[**]** will be attained, that actual results may differ in a material manner from such **[**]** and any failure to meet such **[**]** shall not be deemed to be a breach of any representation or covenant herein). To the Knowledge of Borrower, there are no facts (other than matters of a general economic or industry nature) that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change and that have not been disclosed herein or in such other documents, certificates and written statements furnished or made available to the Collateral Agent or any Lender for use in connection with the transactions contemplated hereby.

4.18. FCPA; Patriot Act; OFAC.

(a) None of Borrower, its Subsidiaries or, to the Knowledge of Borrower, any director, officer, agent or employee of Borrower or any Subsidiary of Borrower has (i) used any corporate funds of Borrower or any of its Subsidiaries for any unlawful contribution, gift, entertainment or other unlawful expense relating to political activity, (ii) made any direct or indirect unlawful payment to any foreign or domestic government official or employee or any person from corporate funds of Borrower or any of its Subsidiaries, (iii) violated or is in violation of any provision of the U.S. Foreign Corrupt Practices Act of 1977, as amended (the “**FCPA**”) or the U.K. Bribery Act (“**UKBA**”) or (iv) made any bribe, rebate, payoff, influence payment, kickback or other unlawful payment, and no part of the proceeds of any Credit Extension will be used, directly or indirectly, for any payments to any governmental official or employee, political party, official of a political party, candidate for political office or anyone else acting in an official capacity, in order to obtain, retain or direct business, or to obtain any improper advantage, in violation of the FCPA, UKBA or any other applicable anti-corruption laws;

(b) (i) The operations of Borrower and its Subsidiaries are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the Bank Secrecy Act of 1970, as amended by Title III of the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT) Act of 2001 and the anti-money laundering laws, rules and regulations of each jurisdiction (foreign or domestic) in which Borrower or any of its Subsidiaries is subject to such jurisdiction’s Requirements of Law (collectively, the “**Anti-Money Laundering Laws**”) and (ii) no action, suit or proceeding by or before any Governmental Authority or any arbitrator involving Borrower or any of its Subsidiaries with respect to the Anti-Money Laundering Laws is pending or to the Knowledge of Borrower, threatened in writing; and

(c) None of Borrower, its Subsidiaries or, to the Knowledge of Borrower, any director, officer, agent or employee of Borrower or any Subsidiary of Borrower is, or is owned or controlled by individuals or entities that are, the target or subject of any sanctions administered and enforced by the Office of Foreign Assets Control of the U.S. Department of the Treasury (“**OFAC**”), the U.S. Department of State, the United Nations Security Council, the European Union, or Her Majesty’s Treasury (collectively “**Sanctions**”). Borrower will not, directly or, to the Knowledge of Borrower, indirectly through an agent, use the proceeds of the Credit Extension, or lend, contribute or otherwise make available such proceeds to any Subsidiary, joint venture partner or other Person, for the purpose of financing the activities of any Person that is the target or subject of Sanctions or in any country or territory that at the time of such funding, is the subject of Sanctions.

(d) The Borrower, its Subsidiaries, and to the Knowledge of Borrower, their respective directors, officers, agents and employees are in compliance with all applicable Sanctions. The Borrower and its Subsidiaries have instituted and maintain procedures reasonably designed to ensure compliance with applicable Sanctions.

4.19. Health Care Matters.

(a) *Compliance with Health Care Laws.* Except as set forth on Schedule 4.19(a) of the Disclosure Letter, each Credit Party [**], each of its Subsidiaries and each officer, Affiliate, and employee acting on behalf of such Credit Party or any of its Subsidiaries, is in compliance [**] with all Health Care Laws applicable to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory.

(b) *Compliance with FDA Laws.* Each Credit Party and, to the Knowledge of Borrower, each of its Subsidiaries, are in compliance [**] with all applicable FDA Laws, including the Food Drug and Cosmetic Act (21 U.S.C. § 301 et seq.) and the regulations promulgated thereunder (the “**FDCA**”), relating to any research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory. The Product distributed or sold in the Territory at all times during the past [**] has been (i) manufactured [**] in accordance with current FDA Good Manufacturing Practices, and (ii) if and to the extent the Product is required to be approved or cleared by the FDA pursuant to the FDCA in order to be legally marketed in the United States for the Product’s intended uses, the Product has been approved or cleared for such intended uses, and no inquiries regarding [**] have been initiated by FDA.

(c) [Reserved].

(d) *Material Statements.* Within the past [**], neither any Credit Party, nor, to the Knowledge of Borrower, any Subsidiary or any officer, Affiliate or employee of any Credit Party or Subsidiary in its capacity as a Subsidiary or as an officer, Affiliate or employee of a Credit Party or Subsidiary (as applicable), nor, to the Knowledge of Borrower, any agent of any Credit Party or Subsidiary, (i) has made an untrue statement of a material fact or a fraudulent statement to any Governmental Authority, (ii) has failed to disclose a material fact to any Governmental Authority, or (iii) has otherwise committed an act, made a statement or failed to make a statement that, at the time such statement or disclosure was made (or, in the case of such failure, should have been made) or such act was committed, could reasonably be expected to constitute a material violation of any Health Care Law.

(e) *Proceedings; Audits.* Except as has been disclosed in the Exchange Act Documents or as set forth on Schedule 4.19(e) of the Disclosure Letter: (i) there is no Adverse Proceeding pending [**] threatened in writing, against any Credit Party or any of its Subsidiaries relating to any allegations of non-compliance with any Health Care Laws, Data Protection Laws or FDA Laws; and (ii) [**] there are no facts, circumstances or conditions that, individually or in the aggregate, would reasonably be expected to form the basis for any such Adverse Proceeding that would reasonably be expected to result in a [**].

(f) *Safety Notices.* Within the past [**], neither any Credit Party nor any of its Subsidiaries has initiated or otherwise engaged in any recalls, field notifications, safety warnings, “dear doctor” letters, investigator notices, safety alerts or other notices of action, including as a result of any Risk Evaluation and Mitigation Strategy proposed or enforced by the FDA, relating to an alleged lack of safety or regulatory compliance of the Product that would reasonably be expected to result [**].

(g) *Prohibited Transactions; No Whistleblowers.* Within the past [**], to the Knowledge of Borrower, neither any Credit Party, any Subsidiary, any of officer, Affiliate or employee of a Credit Party or Subsidiary, nor any other Person acting on behalf of any Credit Party or any Subsidiary, directly or indirectly: (i) has offered or paid any remuneration, in cash or in kind, to, or made any financial arrangements with, any past, present or potential patient, supplier, physician or contractor, in order to illegally obtain business or payments from such Person in [**] of any Health Care Law; (ii) has given or made, or is party to any illegal agreement to give or make, any illegal gift or gratuitous payment of any kind, nature or description (whether in money, property or services) to any past, present or potential patient, supplier, physician or contractor, or any other Person in [**] of any Health Care Law; (iii) has given or made, or is party to any agreement to give or make on behalf of any Credit Party or any of its Subsidiaries, any contribution, payment or gift of funds or property to, or for the private use of, any governmental official, employee or agent where either the contribution, payment or gift or the purpose of such contribution, payment or gift is or was a [**] of the laws of any Governmental Authority having jurisdiction over such payment, contribution or gift; (iv) has established or maintained any unrecorded fund or asset for any purpose or made any [**] misleading, false or artificial entries on any of its books or records for any reason; or (v) has made, or is party to any agreement to make, any payment to any Person with the intention or understanding that any part of such payment would be in [**] of any Health Care Law. To the Knowledge of Borrower, there are no actions pending or threatened (in writing) against any Credit Party or any of its Subsidiaries or any of their respective Affiliates under any foreign, federal or state whistleblower statute, including under the False Claims Act of 1863 (31 U.S.C. § 3729 et seq.).

(h) *Exclusion.* Neither any Credit Party [**] any Subsidiary or any officer, Affiliate or employee having authority to act on behalf of any Credit Party or any Subsidiary, is or, to the Knowledge of Borrower, has been threatened in writing to be: (i) excluded from any Governmental Payor Program pursuant to 42 U.S.C. § 1320a-7b and related regulations; (ii) “suspended” or “debarred” from selling any products to the U.S. government or its agencies pursuant to the Federal Acquisition Regulation relating to debarment and suspension applicable to federal government agencies generally (42 C.F.R. Subpart 9.4), or other U.S. Requirements of Law; (iii) debarred, disqualified, suspended or excluded from participation in Medicare, Medicaid or any other Governmental Payor Program or is listed on the General Services Administration list of excluded parties; or (iv) a party to any other action or proceeding by any Governmental Authority that would prohibit the applicable Credit Party or Subsidiary from distributing or selling the Product in the Territory or providing any services to any governmental or other purchaser pursuant to any Health Care Laws.

(i) *HIPAA*. Each Credit Party and, to the Knowledge of Borrower, each of its Subsidiaries, to the extent applicable, is in [**] with all applicable federal, state and local laws and regulations regarding the privacy, security, and notification of breaches of health information and regarding electronic transactions, including HIPAA, and each Credit Party and, to the Knowledge of Borrower, each of its Subsidiaries, to the extent applicable, has implemented policies, procedures and training customary in the pharmaceutical industry or otherwise adequate to assure continued compliance and to detect non-compliance. No Credit Party is a “covered entity” as defined in 45 C.F.R. § 160.103.

(j) *Corporate Integrity Agreement*. Neither any Credit Party or Subsidiary, nor any of their respective Affiliates, nor any officer, director, managing employee or, to the Knowledge of Borrower, agent (as those terms are defined in 42 C.F.R. § 1001.1001) of any Credit Party or Subsidiary, is a party or is otherwise subject to any order, individual integrity agreement, or corporate integrity agreement with any U.S. Governmental Authority concerning compliance with any laws, rules, or regulations, issued under or in connection with a Governmental Payor Program.

4.20. Regulatory Approvals.

(a) Except as set forth on Schedule 4.20(a) of the Disclosure Letter, each Credit Party and each Subsidiary involved in any research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory has all Regulatory Approvals material to the conduct of its business and operations.

(b) Each Credit Party, each Subsidiary (as applicable) and, to the Knowledge of Borrower, each licensee of a Credit Party or a Subsidiary of any Intellectual Property relating to the Product, is in compliance with, and at all times during the past [**], has complied with, all applicable, federal, state and local laws, rules and regulations governing the research, development, manufacture, production, use, commercialization, marketing, importing, distribution or sale of the Product in the Territory, including all such regulations promulgated by each applicable Regulatory Agency, except where any instance of failure to comply with any such laws, rules or regulations would not, whether individually or taken together with any other such failures, reasonably be expected to result in [**]. No Credit Party or its Subsidiaries has received any written notice from any Regulatory Agency citing action or inaction by any Credit Party or any of its Subsidiaries that would constitute a violation of any applicable foreign, federal, state or local laws, rules, or regulations, including a Warning Letter or Untitled Letter from FDA, which would reasonably be expected to result in [**].

4.21. Supply and Manufacturing.

(a) Except as set forth on Schedule 4.21(a) of the Disclosure Letter, to the Knowledge of Borrower, the Product has, within the past [**], been manufactured in sufficient quantities and of a sufficient quality to satisfy a material portion of the demand of the Product in the Territory, without the occurrence of any event causing inventory of the Product to have become exhausted prior to satisfying such material portion of the demand or any other event in which the manufacture and release to the market of the Product in the Territory does not satisfy a material portion of the sales demand for the Product in the Territory.

(b) Except as disclosed in the Exchange Act Documents or set forth on Schedule 4.21(b) of the Disclosure Letter, to the Knowledge of Borrower, (i) no manufacturer of the Product has received in the past [**] a Form 483 or is currently subject to a Form 483 impacting the Product with respect to any facility in the Territory manufacturing the Product, and (ii) with respect to each such Form 483 received (if any), all scientific and technical violations or other issues relating to good manufacturing practice requirements documented therein, and any disputes regarding any such violations or issues, have been corrected or otherwise resolved.

(c) Except as disclosed in Schedule 4.21(c), no Credit Party or any of its Subsidiaries has received any notice, oral or written, from any party to any Manufacturing Agreement containing any indication by or intent or threat of, such party to reduce or cease, in any material respect, the supply of Product or the active pharmaceutical ingredient incorporated therein in the Territory through [**] (or such earlier date in accordance with the terms and conditions of such Manufacturing Agreement, as applicable).

4.22. **Cybersecurity and Data Protection.**

(a) Except as set forth on Schedule 4.22(a) of the Disclosure Letter, to the Knowledge of the Borrower, the information technology systems used in the business of Borrower and its Subsidiaries operate and perform in all material respects as required to permit Borrower and its Subsidiaries to conduct their business as presently conducted. Except as set forth on Schedule 4.22(a) of the Disclosure Letter, Borrower and its Subsidiaries have implemented and maintain a commercially reasonable enterprise-wide privacy and information security program with plans, policies and procedures for privacy, physical and cyber security, disaster recovery, business continuity and incident response, including reasonable and appropriate administrative, technical and physical safeguards to protect information subject to Data Protection Laws, Company IP and the information technology systems of Borrower and each of its Subsidiaries, from any unauthorized access, use, control, disclosure, destruction or modification. Except as set forth on Schedule 4.22(a) of the Disclosure Letter, to the Knowledge of Borrower, neither Borrower nor any of its Subsidiaries, nor to the Knowledge of Borrower, any vendor of Borrower or any of its Subsidiaries, has, in the past [**], suffered any data breaches or other incidents that (i) have resulted in any unauthorized access, acquisition, use, control, disclosure, destruction, or modification of any information subject to Data Protection Laws or any material Company IP, or (ii) have resulted in unauthorized access to, control of, or disruption of the information technology systems of Borrower or any of its Subsidiaries. Except as would not cause or could not be reasonably expected to result in, individually or in the aggregate, a Material Adverse Change, to the Knowledge of Borrower, Borrower and each of its Subsidiaries is in compliance with the requirements of (A) their respective enterprise-wide privacy and information security programs; (B) Data Protection Laws and (C) all Material Contracts regarding the privacy and security of customer, consumer, patient, employee and other personal data. In the past [**], there have not been any, to the Knowledge of Borrower, third party claims related to, any loss, theft, unauthorized access to, or unauthorized acquisition, modification, disclosure, corruption, destruction, or other misuse of any information subject to Data Protection Laws (including any ransomware incident) that Borrower or any of its Subsidiaries creates, receives, maintains, or transmits.

(b) Except as would not cause or could not be reasonably expected to result in, individually or in the aggregate, a Material Adverse Change, to the Knowledge of Borrower, neither Borrower nor any of its Subsidiaries has received any written notice of any claims, investigations (including investigations by any Governmental Authority), or alleged violations relating to information subject to Data Protection Laws created, received, maintained or transmitted by Borrower or any of its Subsidiaries.

4.23. **Additional Representations and Warranties.**

(a) After giving effect to consummation of the transactions contemplated by this Agreement, there is no Indebtedness other than Permitted Indebtedness described in clauses (a) and (b) of the definition of "Permitted Indebtedness".

(b) There are no Hedging Agreements that are not Permitted Hedging Agreements.

(c) Except as has been disclosed in the Exchange Act Documents, there is no registration rights agreement, investors' rights agreement or other similar agreement relating to, governing or otherwise affecting the ownership of the capital stock or other equity ownership interests of any Credit Party.

5. **AFFIRMATIVE COVENANTS**

Each Credit Party covenants and agrees that, until payment in full of all Obligations (other than inchoate indemnity obligations), each Credit Party shall, and shall cause each of its Subsidiaries to:

5.1. Maintenance of Existence. (a) Preserve, renew and maintain in full force and effect its and all its Subsidiaries' legal existence under the Requirements of Law in their respective jurisdictions of organization, incorporation or formation, other than as otherwise expressly permitted hereunder; (b) take all commercially reasonable action to maintain all rights, privileges (including its good standing), permits, licenses and franchises necessary or desirable for it and all of its Subsidiaries in the ordinary course of its business, except in the case of clause (a) (other than with respect to Borrower) and clause (b) above, (i) to the extent that failure to do so could not reasonably be expected to [**] or (ii) pursuant to a transaction permitted by this Agreement; and (c) comply with all Requirements of Law of any Governmental Authority to which it is subject, except where the failure to do so could not reasonably be expected to [**].

5.2. **Financial Statements, Notices.** Deliver to the Collateral Agent:

(a) Financial Statements.

(i) Annual Financial Statements. As soon as available, but in any event within [**] after the end of each fiscal year of Borrower (or such earlier date on which Borrower is required to file a Form 10-K under the Exchange Act, as applicable), beginning with the fiscal year ending December 31, 2019, a consolidated balance sheet of Borrower and its Subsidiaries as of the end of such fiscal year, and the related consolidated statements of income, cash flows and stockholders' equity for such fiscal year, setting forth in each case in comparative form the figures for the previous fiscal year, all prepared in accordance with Applicable Accounting Standards, with such consolidated financial statements to be audited and accompanied by (x) a report and opinion of Borrower's independent certified public accounting firm of recognized national standing (which report and opinion shall be prepared in accordance with Applicable Accounting Standards and [**]), stating that such financial statements fairly present, in all material respects, the consolidated financial condition, results of operations and cash flows of Borrower and its Subsidiaries as of the dates and for the periods specified in accordance with Applicable Accounting Standards, and (y) if and only if Borrower is required to comply with the internal control provisions pursuant to Section 404 of the Sarbanes-Oxley Act of 2002 requiring an attestation report of such independent certified public accounting firm, an attestation report of such independent certified public accounting firm as to Borrower's internal controls pursuant to Section 404 of the Sarbanes-Oxley Act of 2002 attesting to management's assessment that such internal controls meet the requirements of the Sarbanes-Oxley Act of 2002; provided, however, that Borrower shall be deemed to have made such delivery of such consolidated financial statements if such consolidated financial statements shall have been made available within the time period specified above on the SEC's EDGAR system (or any successor system adopted by the SEC);

(ii) Quarterly Financial Statements. As soon as available, but in any event within [**] after the end of each of the first three (3) fiscal quarters of each fiscal year of Borrower (or such earlier date on which Borrower is required to file a Form 10-Q under the Exchange Act, as applicable), beginning with the fiscal quarter ending March 31, 2020, a consolidated balance sheet of Borrower and its Subsidiaries as of the end of such fiscal quarter, and the related consolidated statements of income and cash flows and for such fiscal quarter and (in respect of the second and third fiscal quarters of such fiscal year) for the then-elapsed portion of Borrower's fiscal year, setting forth in each case in comparative form the figures for the comparable period or periods in the previous fiscal year, all prepared in accordance with Applicable Accounting Standards, subject to normal year-end audit adjustments and the absence of disclosures normally made in footnotes; provided, however, that Borrower shall be deemed to have made such delivery of such consolidated financial statements if such consolidated financial statements shall have been made available within the time period specified above on the SEC's EDGAR system (or any successor system adopted by the SEC). Such consolidated financial statements shall be certified by a Responsible Officer of Borrower as, to his or her knowledge, fairly presenting, in all material respects, the consolidated financial condition, results of operations and cash flows of Borrower and its Subsidiaries as of the dates and for the periods specified in accordance with Applicable Accounting Standards consistently applied, and on a basis consistent with the audited consolidated financial statements referred to under Section 5.2(a)(i), subject to normal year-end audit adjustments and the absence of footnotes; provided, however, that such certification by a Responsible Officer of Borrower shall be deemed to have made if a similar certification is required under the Sarbanes-Oxley Act of 2002 and such certificate shall have been made available within the time period specified above on the SEC's EDGAR system (or any successor system adopted by the SEC);

(iii) Quarterly Compliance Certificate. At any time that Borrower is not required to disclose to the SEC information on an on-going basis under U.S. federal securities laws (including annual reports on Form 10-K, quarterly reports on Form 10-Q, proxy reports on Form DEF 14A or current events on Form 8-K), upon delivery (or within five (5) Business Days of any deemed delivery) of financial statements pursuant to Section 5.2(a)(i) and Section 5.2(a)(ii), a duly completed Compliance Certificate signed by a Responsible Officer, certifying, among other things,

that (i) such financial statements fairly present, in all material respects, the consolidated financial condition, results of operations and cash flows of Borrower and its Subsidiaries as of applicable the dates and for the applicable periods in accordance with Applicable Accounting Standards consistently applied and (ii) no Event of Default or Default has occurred or, if such an Event of Default or Default has occurred, specifying the nature and extent thereof and any corrective action taken or proposed to be taken with respect thereto; and

(iv) Information During Event of Default. As promptly as practicable (and in any event within five (5) Business Days of the request therefor), such additional information regarding the business or financial affairs of Borrower or any of its Subsidiaries, or compliance with the terms of this Agreement or any other Loan Documents, as the Collateral Agent may from time to time reasonably request during the existence of any Event of Default (subject to reasonable requirements of confidentiality, including requirements imposed by Requirements of Law or contract; provided that Borrower shall not be obligated to disclose any information that is reasonably subject to the assertion of attorney-client privilege or attorney work-product).

(b) Notice of Defaults or Events of Default, ERISA Events and Material Adverse Changes. Written notice as promptly as practicable (and in any event within [**]) after a Responsible Officer of Borrower shall have obtained knowledge thereof, of the occurrence of any (i) Default or Event of Default, (ii) ERISA Event or (iii) Material Adverse Change.

(c) Legal Action Notice. Prompt written notice (which shall be deemed given to the extent reported in the Borrower's periodic reporting under the Exchange Act and available on the SEC's EDGAR system (or any successor system adopted by the SEC)) of any legal action, litigation, investigation or proceeding pending or threatened in writing against any Credit Party or any Subsidiary (i) that could reasonably be expected to result in uninsured damages or costs to such Credit Party or such Subsidiary in an amount in excess of [**] and related regulations and standards for purposes of its Exchange Act reporting or (ii) which alleges potential violations of the Health Care Laws, the FDA Laws or any applicable statutes, rules, regulations, standards, guidelines, policies and order administered or issued by any foreign Governmental Authority, which, individually or in the aggregate, could reasonably be expected to [**]; and in each case, provide such additional information (including any material development therein) as the Collateral Agent may reasonably request in relation thereto; provided that Borrower shall not be obligated to disclose any information that is reasonably subject to the assertion of attorney-client privilege or attorney work-product.

5.3. Taxes. Timely file all U.S. federal and state income and other material required Tax returns and reports or extensions therefor and timely pay all material foreign, federal, state and local Taxes, assessments, deposits and contributions imposed upon it or any of its properties or assets or in respect of any of its income, businesses or franchises before any penalty or fine accrue thereon; provided, however, that no such Tax or any claim for Taxes that have become due and payable and have or may become a Lien on any Collateral shall be required to be paid if (a) it is being contested in good faith by appropriate proceedings promptly instituted and diligently conducted, so long as adequate reserves therefor have been set aside on its books and maintained in conformity with Applicable Accounting Standards, and (b) solely in the case of a Tax or claim that has or may become a Lien against any Collateral, such contest proceedings conclusively operate to stay the sale or forfeiture of any portion of any Collateral to satisfy such Tax or claim. No Credit Party will, nor will it permit any of its Subsidiaries to, file or consent to the filing of any consolidated income Tax return with any Person (other than Borrower or any of its Subsidiaries) without the Collateral Agent's consent (which shall not be unreasonably withheld, conditioned or delayed); provided that such consent will be given if such Person is a new holding company whose sole assets are equity interests or debt of the Borrower and any other assets incidental thereto.

5.4. Insurance. Maintain with financially sound and reputable insurance companies, insurance with respect to its properties and business against loss or damage of the kinds customarily insured against by Persons of comparable size engaged in the same or similar business, of such types and in such amounts (after giving effect to any self-insurance reasonable and customary for similarly situated Persons of comparable size engaged in the same or similar businesses as Borrower and its Subsidiaries) as are customarily carried under similar circumstances by such other Persons. Any products liability or general liability insurance

maintained in the United States regarding Collateral shall name the Collateral Agent, on behalf of the Lenders and the other Secured Parties, as additional insured or loss payee, as applicable. So long as no Event of Default shall have occurred and be continuing, the Borrower and its Subsidiaries may retain all or any portion of the proceeds of any insurance of the Borrower and its Subsidiaries (and each Lender shall promptly remit to the Borrower any proceeds with respect to any insurance received by it).

5.5. Operating Accounts. In the case of any Credit Party, contemporaneously with the establishment of any new Collateral Account at or with any bank or other depository or financial institution located in the United States, subject such account to a Control Agreement that is reasonably acceptable to the Collateral Agent. For each Collateral Account that each Credit Party at any time maintains, such Credit Party shall cause the applicable bank or other depository or financial institution located in the United States at or with which any Collateral Account is maintained to execute and deliver a Control Agreement or other appropriate instrument with respect to such Collateral Account to perfect the Collateral Agent's Lien in favor and for the benefit of Lenders and the other Secured Parties in such Collateral Account in accordance with the terms hereunder, which Control Agreement may not be terminated without the prior written consent of the Collateral Agent. The provisions of the previous two (2) sentences shall not apply to **[**]** (all such accounts in sub-clauses (1) through (10) above, collectively, the **"Excluded Accounts"**). Notwithstanding the foregoing, the Credit Parties shall have until the date that is **[**]** (or such longer period as the Collateral Agent may agree in its sole discretion) following (i) the Tranche A Closing Date to comply with the provisions of this Section 5.5 with regards to Collateral Accounts of the Credit Parties in existence on the Tranche A Closing Date (or opened during such **[**]** period (or such longer period as the Collateral Agent may agree in its sole discretion)) and (ii) the closing date of any Acquisition or other Investment to comply with the provisions of this Section 5.5 with regards to Collateral Accounts of the Credit Parties acquired in connection with such Acquisition or other Investment.

5.6. Compliance with Laws. Comply in all respects with the Requirements of Law and all orders, writs, injunctions, decrees and judgments applicable to it or to its business or its assets or properties (including Environmental Laws, ERISA, Anti-Money Laundering Laws, OFAC, FCPA, Health Care Laws, FDA Laws, Data Protection Laws and the Federal Fair Labor Standards Act, and any foreign equivalents thereof), except if the failure to comply therewith would not, individually or taken together with any other such failures, reasonably be expected to result in a Material Adverse Change.

5.7. Protection of Intellectual Property Rights.

(a) Except as could not reasonably be expected to **[**]**, (i) protect, defend and maintain the validity and enforceability of the Company IP material to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory, including defending any future or current oppositions, interference proceedings, reissue proceedings, reexamination proceedings, inter-partes review proceedings, post-grant review proceedings, cancellation proceedings, injunctions, lawsuits, paragraph IV patent certifications or lawsuits under the Hatch-Waxman Act, hearings, investigations, complaints, arbitrations, mediations, demands, International Trade Commission investigations, decrees, or any other disputes, disagreements, or claims, challenging the legality, validity, enforceability or ownership of any Company IP; (ii) maintain the confidential nature of any material trade secrets and trade secret rights used in any research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory; and (iii) not allow any Company IP material to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory to be abandoned, forfeited or dedicated to the public or any Current Company IP Agreement to be terminated by Borrower or any of its Subsidiaries, as applicable, without the Collateral Agent's prior written consent (such consent not to be unreasonably withheld, conditioned or delayed); provided, however, that with respect to any such Company IP that is not owned by Borrower or any of its Subsidiaries, the obligations in clauses (i) and (iii) above shall apply only to the extent Borrower or any of its Subsidiaries have the right to take such actions or to cause any licensee or other third party to take such actions pursuant to applicable agreements or contractual rights.

(b) (i) Except as Borrower may otherwise determine in its reasonable business judgment, use [**] at its (or its Subsidiaries', as applicable) sole expense, either directly or indirectly, with respect to any licensee or licensor under the terms of any Credit Party's (or any of its Subsidiary's) agreement with the respective licensee or licensor, as applicable, to take any and all actions (including taking legal action to specifically enforce the applicable terms of any license agreement) and prepare, execute, deliver and file agreements, documents or instruments which are necessary or desirable to (A) prosecute and maintain the Company IP material to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory and (B) diligently defend or assert the Company IP material to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory against material infringement, misappropriation, violation or interference by any other Persons and, in the case of Copyrights, Trademarks and Patents within the Company IP, against any claims of invalidity or unenforceability (including by bringing any legal action for infringement, dilution, violation or defending any counterclaim of invalidity or action of a non-Affiliate third party for declaratory judgment of non-infringement or non-interference); and (ii) use [**] to cause any licensee or licensor of any Company IP not to, and such Credit Party shall not, disclaim or abandon, or fail to take any action necessary or desirable to prevent the disclaimer or abandonment of Company IP material to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory.

(c) Except as Borrower may otherwise determine in its reasonable business judgment and as required pursuant to any applicable license or other binding agreement, protect, defend and maintain market exclusivity for the manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory through the Term Loan Maturity Date; provided, however, that [**] then (i) the Term Loan Maturity Date shall be decreased by the number of days equal to the Amortization Reduction Days and (ii) the scheduled amortization of the Tranche A Term Loan or the Tranche B Term Loan, as applicable, then in effect pursuant to Section 2.2(b) shall be decreased by the number of days equal to the Amortization Reduction Days (and each applicable Payment Date will be decreased accordingly); provided, further, that [**]. Except as Borrower may otherwise determine in its reasonable business judgment (including without limitation taking into account any attorney-client privilege, conflicts of interests, confidentiality obligations, protective orders or other similar considerations), Borrower agrees to notify the Collateral Agent in writing and keep the Collateral Agent informed of any material filings in any opposition, interference proceeding, reissue proceeding, reexamination proceeding, inter-partes review proceeding, post-grant review proceeding, cancellation proceeding, injunction, lawsuit, paragraph IV patent certification or lawsuits under the Hatch-Waxman Act, hearing, investigation, complaint, arbitration, mediation, demand, International Trade Commission investigation, decree, or any other dispute, disagreement, or claim, in each case challenging the legality, validity, enforceability or ownership of any Company IP.

5.8. Books and Records. Maintain proper Books, in which entries that are full, true and correct in all material respects and are in conformity with Applicable Accounting Standards consistently applied shall be made of all material financial transactions and matters involving the assets, properties and business of such Credit Party (or such Subsidiary), as the case may be.

5.9. Access to Collateral; Audits. Allow the Collateral Agent, or its agents or representatives, at any time after the occurrence and during the continuance of an Event of Default, during normal business hours and upon reasonable advance notice, to visit and inspect the Collateral and inspect, copy and audit any Credit Party's Books. The foregoing inspections and audits shall be at the relevant Credit Party's expense.

5.10. Use of Proceeds. (a) Use the proceeds of the Term Loans to fund its general corporate requirements, and (b) not use the proceeds of the Term Loans or any other Credit Extensions, directly or indirectly, for the purpose of purchasing or carrying any Margin Stock, for the purpose of reducing or retiring any Indebtedness that was originally incurred to purchase or carry any Margin Stock, for the purpose of extending credit to any other Person for the purpose of purchasing or carrying any Margin Stock or for any other purpose that might cause any Term Loan or other Credit Extension to be considered a "purpose credit" within the meaning of Regulation T, U or X of the Federal Reserve Board. If requested by the Collateral Agent, Borrower shall complete and sign Part I of a copy of Federal Reserve Form G-3 referred to in Regulation U and deliver such copy to the Collateral Agent.

5.11. Further Assurances. Promptly upon the reasonable written request of the Collateral Agent, execute, acknowledge and deliver such further documents and do such other acts and things in order to effectuate or carry out more effectively the purposes of this Agreement and the other Loan Documents at its expense, including after the Closing Date taking such steps as are reasonably deemed necessary or desirable by the Collateral Agent to maintain, protect and enforce its Lien in favor and for the benefit of Lenders and the other Secured Parties on Collateral securing the Obligations created under the Security Agreement and the other Loan Documents in accordance with the terms of the Security Agreement and the other Loan Documents, subject to Permitted Liens.

5.12. Additional Collateral; Guarantors. From and after the Closing Date, except as otherwise approved in writing by the Collateral Agent, each Credit Party shall cause each of its Subsidiaries (other than Excluded Subsidiaries) to guarantee the Obligations and to cause each such Subsidiary to grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties a first priority security interest in and Lien upon, and pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties, subject to Permitted Liens, all of such Subsidiary's properties and assets constituting Collateral, whether now existing or hereafter acquired or existing, to secure such guaranty; provided, that such Credit Party's obligations to cause any Subsidiaries formed or acquired after the Closing Date to take the foregoing actions shall be subject to the timing requirements of Section 5.13. Furthermore, except as otherwise approved in writing by the Collateral Agent, each Credit Party, from and after the Closing Date, shall, and shall cause each of its Subsidiaries to grant the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties a first priority security interest in and Lien upon, and pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties, subject to Permitted Liens, the limitations set forth herein and the limitations set forth in the other Loan Documents, all of the Equity Interests (other than Excluded Equity Interests) of each of its Subsidiaries. Subject to Section 5.14, in connection with each pledge of certificated Equity Interests required under the Loan Documents, the Credit Parties shall deliver, or cause to be delivered, to the Collateral Agent, such certificate(s) together with stock powers or assignments, as applicable, properly endorsed for transfer to the Collateral Agent or duly executed in blank, in each case reasonably satisfactory to the Collateral Agent. Subject to Section 5.14, in connection with each pledge of uncertificated Equity Interests required under the Loan Documents, the Credit Parties shall deliver, or cause to be delivered, to the Collateral Agent an executed uncertificated stock control agreement among the issuer, the registered owner and the Collateral Agent, in form and substance reasonably satisfactory to the Collateral Agent.

5.13. Formation or Acquisition of Subsidiaries. If Borrower or any of its Subsidiaries at any time after the Closing Date forms or acquires a Subsidiary (other than an Excluded Subsidiary) (including by division), as promptly as practicable but in no event later than [**] (or such longer period as the Collateral Agent may agree in its sole discretion) after such formation or acquisition: (a) without limiting the generality of clause (d) below, Borrower will cause such Subsidiary to execute and deliver to the Collateral Agent a joinder to the Security Agreement in the form attached thereto and any relevant IP Agreement or other Collateral Documents, as applicable; (b) Borrower will deliver to the Collateral Agent (i) true, correct and complete copies of the Operating Documents of such Subsidiary, (ii) a Secretary's Certificate, certifying that the copies of such Operating Documents are true, correct and complete (such Secretary's Certificate to be in form and substance reasonably satisfactory to the Collateral Agent) and (iii) a good standing certificate for such Subsidiary certified by the Secretary of State (or the equivalent thereof) of its jurisdiction of organization, incorporation or formation; (c) Borrower will deliver to the Collateral Agent a Perfection Certificate, updated to reflect the formation or acquisition of such Subsidiary; and (d) Borrower will cause such Subsidiary to satisfy all requirements contained in this Agreement (including Section 5.12) and each other Loan Document if and to the extent applicable to such Subsidiary. Borrower, Lenders and the Collateral Agent hereby agree that any such Subsidiary shall constitute a Credit Party for all purposes hereunder as of the date of the execution and delivery of the joinder contemplated by clause (a) above. Any document, agreement or instrument executed or issued pursuant to this Section 5.13 shall be a Loan Document.

5.14. Post-Closing Requirements. Borrower will, and will cause each of its Subsidiaries to, take each of the actions set forth on Schedule 5.14 of the Disclosure Letter within the time period prescribed therefor on such schedule (or such longer period as the Collateral Agent may agree in its sole discretion), which shall include, among other things, that notwithstanding anything to the contrary in Section 5.5, the Credit Parties shall have until the date that is [**] following the Tranche A Closing Date (or such longer

period as the Collateral Agent may agree in its sole discretion) to comply with the provisions of Section 5.5 with regards to Collateral Accounts of the Credit Parties in existence on the Tranche A Closing Date or opened during such [**] (or such longer period as the Collateral Agent may agree in its sole discretion). All representations and warranties and covenants contained in this Agreement and the other Loan Documents shall be deemed modified to the extent necessary to take the actions set forth on Schedule 5.14 of the Disclosure Letter within the time periods set forth therein, rather than elsewhere provided in the Loan Documents, such that to the extent any such action set forth in Schedule 5.14 of the Disclosure Letter is not overdue, the applicable Credit Party shall not be in breach of any representation or warranty or covenant contained in this Agreement or any other Loan Document applicable to such action for the period from the Tranche A Closing Date until the date on which such action is required to be fulfilled as set forth on Schedule 5.14 of the Disclosure Letter.

5.15. Environmental.

(a) Deliver to the Collateral Agent:

(i) as soon as practicable following receipt thereof, copies of all environmental audits, investigations, analyses and reports of any kind or character, whether prepared by personnel of Borrower or any of its Subsidiaries or by independent consultants, governmental authorities or any other Persons, with respect to significant environmental matters at any Facility or with respect to any material Environmental Claims;

(ii) promptly upon a Responsible Officer of any Credit Party or any of its Subsidiaries obtaining knowledge of the occurrence thereof, written notice describing in reasonable detail (A) any Release required to be reported to any federal, state or local governmental or regulatory agency under any applicable Environmental Laws, (B) any remedial action taken by any Credit Party or any other Person in response to (x) any Hazardous Materials Activities, the existence of which, individually or in the aggregate, could reasonably be expected to result in one or more Environmental Claims resulting in a Material Adverse Change, or (y) any Environmental Claims that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change, and (C) any Credit Party's discovery of any occurrence or condition on any real property adjoining or in the vicinity of any Facility that could cause such Facility or any part thereof to be subject to any material restrictions on the ownership, occupancy, transferability or use thereof under any Environmental Laws, provided, that with respect to real property adjoining or in the vicinity of any Facility, Borrower shall have no duty to affirmatively investigate or make any efforts to become or stay informed regarding any such adjoining or nearby properties;

(iii) as soon as practicable following the sending or receipt thereof by any Credit Party, a copy of any and all written communications with respect to (A) any Environmental Claims that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change, (B) any Release required to be reported to any federal, state or local governmental or regulatory agency, or (C) any request for information from any Governmental Authority that suggests such Governmental Authority is investigating whether any Credit Party or any of its Subsidiaries may be potentially responsible for any Hazardous Materials Activity that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change;

(iv) prompt written notice describing in reasonable detail (A) any proposed acquisition of stock, assets, or property by Borrower or any of its Subsidiaries that, individually or in the aggregate, could reasonably be expected to (x) expose Borrower or any of its Subsidiaries to, or result in, Environmental Claims that could reasonably be expected to result in a Material Adverse Change or (y) affect the ability of Borrower or any of its Subsidiaries to maintain in full force and effect all material Governmental Approvals required under any Environmental Laws for their respective operations, and (B) any proposed action to be taken by Borrower or any of its Subsidiaries to modify current operations in a manner that, individually or taken together with any other such proposed actions, could reasonably be expected to subject Borrower or any of its Subsidiaries to any additional material obligations or requirements under any Environmental Laws; and

(v) with reasonable promptness, such other documents and information as from time to time may be reasonably requested by the Collateral Agent in relation to any matters disclosed pursuant to this Section 5.15(a).

(b) Each Credit Party shall, and shall cause each of its Subsidiaries to, promptly take any and all actions reasonably necessary to (i) cure any violation of applicable Environmental Laws by Borrower or any of its Subsidiaries that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change, and (ii) make an appropriate response to any Environmental Claim against Borrower or any of its Subsidiaries and discharge any obligations it may have to any Person thereunder where failure to do so, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Change.

5.16. Inventory; Returns; Maintenance of Properties. Keep all Inventory in good and marketable condition, free from material defects and otherwise keep all Inventory in material compliance with all applicable FDA Good Manufacturing Practices. Returns and allowances between Borrower and its Account Debtors shall follow Borrower's customary practices as they exist at the Effective Date or, solely with respect to the Acquired Business, any new returns and allowances practices established thereafter in good faith by Borrower. Each Credit Party will, and will cause each of its Subsidiaries to, maintain or cause to be maintained in good repair, working order and condition, ordinary wear and tear, casualty and condemnation excepted, all material tangible properties used or useful in its respective business, and from time to time will make or cause to be made all appropriate repairs, renewals and replacements thereof except where failure to do so could not reasonably be expected to result in a Material Adverse Change.

6. NEGATIVE COVENANTS

Each Credit Party covenants and agrees that, until payment in full of all Obligations (other than inchoate indemnity obligations), such Credit Party shall not, and shall cause each of its Subsidiaries not to:

6.1. Dispositions. Convey, sell, lease, transfer, assign, enter into a coexistence agreement, exclusively license out, or otherwise dispose of (including any sale-leaseback or any transfer of assets pursuant to a plan of division), directly or indirectly and whether in one or a series of transactions (collectively, "**Transfer**"), all or any part of its properties or assets constituting Collateral under the Loan Documents (including, for the avoidance of doubt, any Equity Interests constituting Collateral issued by any Subsidiary which are owned or otherwise held by such Credit Party) or any Company IP that does not constitute Collateral or Other Assets but is in any way required or necessary to own, license, develop, commercialize or otherwise fully exploit the market potential of the Product in the Territory; except, in each case of this Section 6.1, for Permitted Transfers.

6.2. Fundamental Changes; Location of Collateral.

(a) Without at least **[**]** prior written notice to the Collateral Agent, solely in the case of a Credit Party: (i) change its jurisdiction of organization, incorporation or formation, (ii) change its organizational structure or type, (iii) change its legal name, or (iv) change any organizational number (if any) assigned by its jurisdiction of organization, incorporation or formation.

(b) Other than Product or Inventory **[**]**, not deliver any **[**]** portion of the Collateral to one or more leased locations or bailees, unless (i) such Credit Party, promptly and in no event later than **[**]** following such delivery of Collateral, has delivered written notice to the Collateral Agent, which such notice shall in reasonable detail identify such Collateral and indicate the location from which it is being delivered and the location to which it is being delivered (and may be in the form of an updated Perfection Certificate; provided that any update to the Perfection Certificate by any Credit Party pursuant to this Section 6.2(b) shall not relieve any Credit Party of any other Obligation under this Agreement), and (ii) such Credit Party **[**]** landlord or bailee in the United States to enter into no later than **[**]** following such delivery of Collateral, a landlord's consent or bailee agreement (in form and substance reasonably satisfactory to the Collateral Agent), as applicable, in favor of the Collateral Agent for the benefit of the Lenders and the other Secured Parties. Notwithstanding the foregoing, the Credit Parties shall have until the date that is **[**]** following (i) the Tranche A Closing Date to comply with the provisions of this Section 6.2(b) with regards to landlords or bailees holding any material portion of the Collateral as of the Tranche A Closing Date (or during such **[**]**).

6.3. Mergers, Acquisitions, Liquidations or Dissolutions.

(a) Merge, divide itself into two (2) or more entities, consolidate, liquidate or dissolve, or permit any of its Subsidiaries to merge, divide itself into two (2) or more entities, consolidate, liquidate or dissolve with or into any other Person, except that:

(i) any Subsidiary of Borrower may merge or consolidate with or into Borrower, provided that Borrower is the surviving entity,

(ii) any Subsidiary of Borrower may merge or consolidate with any other Subsidiary of Borrower, provided that if any party to such merger or consolidation is a Credit Party then either (x) such Credit Party is the surviving entity or (y) the surviving or resulting entity executes and delivers to the Collateral Agent a joinder to the Security Agreement in the form attached thereto and any relevant IP Agreement or other Collateral Documents, as applicable, and otherwise satisfies the requirements of Section 5.13 substantially contemporaneously with completion of such merger or consolidation to;

(iii) any Subsidiary of Borrower may divide itself into two (2) or more entities or be dissolved or liquidated, provided that the properties and assets of such Subsidiary are allocated or distributed to an existing or newly-formed Credit Party; and

(iv) any Permitted Investment may be structured as a merger or consolidation; or

(b) make, or permit any of its Subsidiaries to make, Acquisitions outside the ordinary course of business, including any purchase of the assets of any division or line of business of any other Person, other than Permitted Acquisitions or Permitted Investments.

6.4. Indebtedness. Directly or indirectly, create, incur, assume or guaranty, or otherwise become or remain directly or indirectly liable with respect to, any Indebtedness (including any Indebtedness consisting of obligations evidenced by a bond, debenture, note or other similar instrument) that is not Permitted Indebtedness; provided, however, that the accrual of interest, the accretion of accreted value and the payment of interest in the form of additional Indebtedness shall not be deemed to be an incurrence of Indebtedness for purposes of this Section 6.4.

6.5. Encumbrances. Except for Permitted Liens, (i) create, incur, allow, or suffer to exist any Lien on any Collateral, or (ii) permit (other than pursuant to the terms of the Loan Documents) any material portion of the Collateral not to be subject to the first priority security interest granted in the Loan Documents or otherwise pursuant to the Collateral Documents, in each case of this clause (ii), other than as a direct result of any action by the Collateral Agent or any Lender or failure of the Collateral Agent or any Lender to perform an obligation thereof under the Loan Documents.

6.6. No Further Negative Pledges. No Credit Party nor any of its Subsidiaries shall enter into any agreement, document or instrument directly or indirectly prohibiting (or having the effect of prohibiting) or limiting the ability of such Credit Party or Subsidiary to create, incur, assume or suffer to exist any Lien upon any Collateral, whether now owned or hereafter acquired, in favor of the Collateral Agent for the benefit of Lenders and the other Secured Parties with respect to the Obligations or under the Loan Documents, in each case of this Section 6.6, other than Permitted Negative Pledges.

6.7. Maintenance of Collateral Accounts. Maintain any Collateral Account except pursuant to the terms of Section 5.5 hereof.

6.8. Distributions; Investments.

- (a) Subject to Permitted Subsidiary Distribution Conditions, pay any dividends or make any distribution or payment on or redeem, retire or purchase any Equity Interests, except, in each case of this Section 6.8, for Permitted Distributions.
- (b) Directly or indirectly make any Investment (including any loans) other than Permitted Investments.
- (c) Repay or prepay any Indebtedness owed by such Subsidiary to Borrower or any other Subsidiary of Borrower unless such payment or prepayment is made directly or indirectly to a Credit Party.

Notwithstanding the foregoing, and for the avoidance of doubt, this Section 6.8 shall not prohibit (i) the conversion by holders of (including any cash payment upon conversion), or required payment of any principal or premium on (including, for the avoidance of doubt, in respect of a required repurchase in connection with the redemption of Permitted Convertible Debt upon satisfaction of a condition related to the stock price of Borrower's common stock) or required payment of any interest with respect to, any Permitted Convertible Indebtedness in each case, in accordance with the terms of the indenture governing such Permitted Convertible Indebtedness, or (ii) the entry into (including the payment of premiums in connection therewith) or any required payment with respect to, or required early unwind or settlement of, any Permitted Bond Hedge Transaction or Permitted Warrant Transaction, in each case, in accordance with the terms of the agreement governing such Permitted Bond Hedge Transaction or Permitted Warrant Transaction.

Notwithstanding the foregoing, Borrower may repurchase, exchange or induce the conversion of Permitted Convertible Indebtedness by delivery of shares of Borrower's common stock or a different series of Permitted Convertible Indebtedness or by payment of cash (in an amount that does not exceed the proceeds received by Borrower from the substantially concurrent issuance of shares of Borrower's common stock *plus* the net cash proceeds, if any, received by the Borrower pursuant to the related exercise or early unwind or termination of the related Permitted Bond Hedge Transactions and Permitted Warrant Transactions, if any, pursuant to the immediately following proviso); provided that, for the avoidance of doubt, substantially concurrently with, or a commercially reasonable period of time before or after, the related settlement date for the Permitted Convertible Debt that are so repurchased, exchanged or converted, Borrower may exercise or unwind or terminate early (whether in cash, shares or any combination thereof) the portion of the Permitted Bond Hedge Transactions and Permitted Warrant Transactions, if any, corresponding to such Permitted Convertible Indebtedness that is so repurchased, exchanged or converted.

6.9. [Reserved]

6.10. Subordinated Debt. Make or permit any voluntary or optional prepayment of any Subordinated Debt not otherwise expressly permitted pursuant to the applicable intercreditor, subordination or other similar agreement to which such Subordinated Debt is subject.

6.11. Amendments or Waivers of Organizational Documents. Amend, restate, supplement or otherwise modify, or waive, any provision of its Operating Documents in a manner that could reasonably be expected to result in a Material Adverse Change.

6.12. Compliance.

(a) Become an "investment company" under the Investment Company Act of 1940, as amended, or undertake as one of its important activities extending credit to purchase or carry margin stock (as defined in Regulation U of the Board of Governors of the Federal Reserve System), or use the proceeds of any Credit Extension for that purpose;

(b) No ERISA Affiliate shall cause or suffer to exist (i) any event that would result in the imposition of a Lien on any assets or properties of any Credit Party or a Subsidiary of a Credit Party with respect to any Plan or Multiemployer Plan or (ii) any other ERISA Event that, in each case of this clause (b), could reasonably be expected to, individually or in the aggregate, result in a Material Adverse Change; or

(c) Permit the occurrence of any other event with respect to any present pension, profit sharing or deferred compensation plan that could reasonably be expected to result in a Material Adverse Change.

(d) **Compliance with Anti-Terrorism Laws.** The Collateral Agent and each Lender hereby notifies each Credit Party that pursuant to the requirements of Anti-Terrorism Laws, and such Person's policies and practices, the Collateral Agent and each Lender is required to obtain, verify and record certain information and documentation that identifies each Credit Party and its principals, which information includes the name and address of each Credit Party and its principals and such other information that will allow the Collateral Agent and each Lender to identify such party in accordance with Anti-Terrorism Laws. No Credit Party will, nor will any Credit Party permit any of its Subsidiaries or controlled Affiliates to, directly or indirectly, knowingly enter into any documents or contracts with any Person listed on the OFAC Lists. Each Credit Party shall [**] notify the Collateral Agent and each Lender in writing upon any Responsible Officer of Borrower having knowledge that any Credit Party or any Subsidiary or Affiliate of any Credit Party is listed on the OFAC Lists or (a) is convicted on, (b) pleads *nolo contendere* to, (c) is indicted on, or (d) is arraigned and held over on charges involving money laundering or predicate crimes to money laundering. No Credit Party will, nor will any Credit Party permit any of its Subsidiaries or Affiliates to, directly or indirectly, (i) conduct any business or engage in any transaction or dealing with any Blocked Person, including the making or receiving of any contribution of funds, goods or services to or for the benefit of any Blocked Person, (ii) deal in, or otherwise engage in any transaction relating to, any property or interests in property blocked pursuant to Executive Order No. 13224, any similar executive order or other Anti-Terrorism Law, or (iii) engage in or conspire to engage in any transaction that evades or avoids or violates, or has the purpose of evading or avoiding, or attempts to violate, any of the prohibitions set forth in Executive Order No. 13224 or other Anti-Terrorism Law.

6.13. Amendments or Waivers of Current Company IP Agreements. (a) Waive, amend, cancel or terminate, exercise or fail to exercise, any material rights constituting or relating to any of the Current Company IP Agreements or (b) breach, default under, or take any action or fail to take any action that, with the passage of time or the giving of notice or both, would constitute a default or event of default under any of the Current Company IP Agreements, in each case of this Section 6.14, which would, individually or taken together with any other such waivers, amendments, cancellations, terminations, exercises or failures, reasonably be expected to result in a Material Adverse Change.

6.14. Minimum Product Net Sales. Permit [**] tested at the end of each fiscal quarter commencing with the fiscal quarter ending December 31, 2020, [**].

7. EVENTS OF DEFAULT

Any one of the following shall constitute an event of default (an "Event of Default") under this Agreement:

7.1. Payment Default. Any Credit Party fails to (a) make any payment of any principal of the Term Loans when and as the same shall become due and payable, whether at the due date thereof (including pursuant to Section 2.2(c)) or at a date fixed for prepayment (whether voluntary or mandatory) thereof or by acceleration thereof or otherwise, or (b) within [**] after the same becomes due, any payment of interest or premium pursuant to Section 2.2, including any applicable Additional Consideration, Makewhole Amount or Prepayment Premium, or any other Obligations (which [**] cure period shall not apply to any such payments due on the Term Loan Maturity Date, such earlier date pursuant to Section 2.2(c)(ii) hereof or the date of acceleration pursuant to Section 8.1(a) hereof). A failure to pay any such interest, premium or Obligations pursuant to the foregoing clause (b) prior to the end of such [**] period shall not constitute an Event of Default (unless such payment is due on the Term Loan Maturity Date, such earlier date pursuant to Section 2.2(c)(ii) hereof or the date of acceleration pursuant to Section 8.1(a) hereof).

7.2. Covenant Default.

(a) The Credit Parties: (i) fail or neglect to perform any obligation in Sections [**] or (ii) violate any covenant in Section [**]; or

(b) The Credit Parties fail or neglect to perform, keep, or observe any other term, provision, condition, covenant or agreement contained in this Agreement or any Loan Documents on its part to be performed, kept or observed and such failure continues for [**], after the earlier of the date on which (i) a Responsible Officer of any Credit Party becomes aware of such failure and (ii) written notice thereof shall have been given to the Borrower by the Collateral Agent or any Lender. Cure periods provided under this Section 7.2(b) shall not apply, among other things, to any of the covenants referenced in clause (a) above.

7.3. Material Adverse Change. A Material Adverse Change occurs.

7.4. Attachment; Levy; Restraint on Business.

(a) (i) The service of process seeking to attach, by trustee or similar process, any funds of any Credit Party or of any entity under the control of any Credit Party (including a Subsidiary) in excess of \$[**] on deposit or otherwise maintained with the Collateral Agent, or (ii) a notice of lien or levy is filed against any of material portion of Collateral by any Governmental Authority, and the same under sub-clauses (i) and (ii) hereof are not, within [**] after the occurrence thereof, discharged or stayed (whether through the posting of a bond or otherwise); provided, however, that no Credit Extensions shall be made during any [**] cure period; or

(b) (i) Any material portion of Collateral is attached, seized, levied on, or comes into possession of a trustee or receiver, or (ii) any court order enjoins, restrains, or prevents Borrower and its Subsidiaries from conducting any material part of their business, taken as a whole.

7.5. Insolvency.

(a) An involuntary proceeding shall be commenced or an involuntary petition shall be filed in a court of competent jurisdiction seeking: (i) relief in respect of any Credit Party, or of a substantial part of the property of any Credit Party, under Title 11 of the United States Code, as now constituted or hereafter amended, or any other federal, state or foreign bankruptcy, insolvency, receivership or similar law; (ii) the appointment of a receiver, trustee, custodian, sequestrator, conservator or similar official for any Credit Party or for a substantial part of the property or assets of any Credit Party; or (iii) the winding-up or liquidation of any Credit Party, and such proceeding or petition shall continue undismissed or unstayed for [**] or an order or decree approving or ordering any of the foregoing shall be entered; or

(b) Any Credit Party shall: (i) voluntarily commence any proceeding or file any petition seeking relief under Title 11 of the United States Code, as now constituted or hereafter amended, or any other federal, state or foreign bankruptcy, insolvency, receivership or similar law; (ii) consent to the institution of, or fail to contest in a timely and appropriate manner, any proceeding or the filing of any petition described in clause (a) above; (iii) apply for or consent to the appointment of a receiver, trustee, custodian, sequestrator, conservator or similar official for any Credit Party or for a substantial part of the property or assets of any Credit Party; (iv) file an answer admitting the material allegations of a petition filed against it in any such proceeding; (v) make a general assignment for the benefit of creditors; (vi) become unable, admit in writing its inability or fail generally to pay its debts as they become due; (vii) take any action for the purpose of effecting any of the foregoing; or (viii) wind up or liquidate (except as otherwise expressly permitted hereunder).

7.6. Other Agreements. Any Credit Party fails to pay any [**] (other than the [**] represented by this Agreement and the other Loan Documents) within any applicable grace period after such payment is due and payable (including at final maturity) or after the acceleration of any such [**] by the holder(s) thereof because of a default, in each case, if the total amount of such [**] unpaid or accelerated exceeds \$[**].

7.7. **Judgments.** One or more final, non-appealable judgments, orders, or decrees for the payment of money in an amount in excess of \$[**] (but excluding any final judgments, orders, or decrees for the payment of money that are covered by independent third-party insurance as to which liability has not been denied by such insurance carrier or by an indemnification claim against a solvent and unaffiliated Person that is not a Credit Party as to which such Person has not denied liability for such claim), shall be rendered against one or more Credit Parties and the same are not, within [**] after the entry thereof, discharged or execution thereof stayed or bonded pending appeal, or such judgments are not discharged prior to the expiration of any such stay.

7.8. **Misrepresentations.** Any Credit Party or any Person acting for any Credit Party makes or is deemed to make any representation, warranty, or other statement now or later in this Agreement, any other Loan Document or in any writing delivered to the Collateral Agent or any Lender or to induce the Collateral Agent or any Lender to enter this Agreement or any other Loan Document, and such representation, warranty, or other statement is incorrect in any material respect (or, to the extent any such representation, warranty or other statement is qualified by materiality or Material Adverse Change, in any respect) when made or deemed to be made.

7.9. **Loan Documents; Collateral.** Any material provision of any Loan Document shall for any reason cease to be valid and binding on or enforceable against any Credit Party, or any Credit Party shall so state in writing or bring an action to limit its obligations or liabilities thereunder; or any Collateral Document shall for any reason (other than pursuant to the terms thereof) cease to create a valid security interest in any material portion of the Collateral purported to be covered thereby or such security interest shall for any reason (other than pursuant to the terms of the Loan Documents) cease to be a perfected and first priority security interest in any material portion of the Collateral subject thereto, subject only to Permitted Liens, in each case, other than as a direct result of any action by the Collateral Agent or any Lender or failure of the Collateral Agent or any Lender to perform an obligation thereof under the Loan Documents.

7.10. **ERISA Event.** An ERISA Event occurs that, individually or taken together with any other ERISA Events, results or could reasonably be expected to result in a Material Adverse Change or the imposition of a Lien on any Collateral.

8. **RIGHTS AND REMEDIES UPON AN EVENT OF DEFAULT**

8.1. **Rights and Remedies.** While an Event of Default occurs and continues, the Collateral Agent will, or at the request of the Required Lenders, without notice or demand:

(a) declare all Obligations (including, for the avoidance of doubt, the Makewhole Amount or Prepayment Premium that is payable pursuant to Section 2.2(e) and Section 2.2(f), as applicable) immediately due and payable (but if an Event of Default described in [**] occurs all Obligations, including the Makewhole Amount and Prepayment Premium that is payable pursuant to Section 2.2(e) and Section 2.2(f), as applicable, are automatically and immediately due and payable without any action by the Collateral Agent or any Lender), whereupon all Obligations for principal, interest, premium or otherwise (including, for the avoidance of doubt, the Makewhole Amount and Prepayment Premium that is payable pursuant to Section 2.2(e) and Section 2.2(f), as applicable) shall become due and payable by Borrower without presentment, demand, protest or other notice of any kind, which are all expressly waived by the Credit Parties hereby;

(b) stop advancing money or extending credit for Borrower's benefit under this Agreement;

(c) settle or adjust disputes and claims directly with Account Debtors for amounts on terms and in any order that the Collateral Agent considers advisable, notify any Person owing Borrower money of the Collateral Agent's security interest in favor and for the benefit of the Lenders and the other Secured Parties in such funds, and verify the amount of the Collateral Accounts;

(d) make any payments and do any acts it considers necessary or reasonable to protect the Collateral or the Collateral Agent's security interest in favor and for the benefit of Lenders and the other Secured Parties in the Collateral. Borrower shall assemble the Collateral if the Collateral Agent or the Required Lenders requests and make it available as the Collateral Agent designates or the Required Lenders designate. The Collateral Agent or its agents or representatives may enter premises where the Collateral is located, take and maintain possession of any part of the Collateral, and pay, purchase, contest, or compromise any Lien which appears to be prior or superior to its security interest in favor and for the benefit of Lenders and the other Secured Parties and pay all expenses incurred. Borrower grants the Collateral Agent a license to enter and occupy (and for its agents or representatives to enter and occupy) any of its premises, without charge, to exercise any of the Collateral Agent's or any Lender's rights or remedies;

(e) apply to the Obligations (i) any balances and deposits of Borrower it holds, or (ii) any amount held by the Collateral Agent owing to or for the credit or the account of Borrower;

(f) ship, reclaim, recover, store, finish, maintain, repair, prepare for sale, advertise for sale, and sell the Collateral. With respect to any and all Intellectual Property owned by any Credit Party and included in Collateral, each Credit Party hereby grants to the Collateral Agent, for the benefit of all Secured Parties, as of the Tranche A Closing Date, a non-exclusive, royalty-free license or other right to use, without charge, such Intellectual Property in advertising for sale and selling any Collateral and, in connection with the Collateral Agent's exercise of its rights under this Section 8.1, Borrower's rights under all licenses and all franchise Contracts inure to the benefit of all Secured Parties. Each Credit Party shall retain the right to control the Collateral Agent's use of its trade names and Trademarks and such trade names and Trademarks, together with the goodwill associated therewith, are and remain the exclusive property of the Credit Parties, and any and all use of the same by the Collateral Agent shall inure to the benefit of the Credit Parties;

(g) place a "hold" on any account maintained with the Collateral Agent or deliver a notice of exclusive control, any entitlement order, or other directions or instructions pursuant to any Control Agreement or similar agreements providing control of any Collateral;

(h) demand and receive possession of Borrower's Books regarding Collateral; and

(i) exercise all rights and remedies available to the Collateral Agent or any Lender under the Collateral Documents or any other Loan Documents or at law or equity, including all remedies provided under the Code (including disposal of the Collateral pursuant to the terms thereof).

The Collateral Agent and each Lender agrees that in connection with any foreclosure or other exercise of rights under this Agreement or any other Loan Document with respect to any Intellectual Property included in the Collateral, the rights of the licensees under any license of such Intellectual Property will not be terminated, limited or otherwise adversely affected so long as no default exists thereunder in a way that would permit the licensor to terminate such license (commonly termed a non-disturbance). Without limitation to any other provision herein or in any other Loan Document, while an Event of Default occurs and continues, at the Collateral Agent's or the Required Lenders' request, Borrower shall, promptly following the receipt of such request, take such commercially reasonable actions as are required or necessary to allow the Collateral Agent to collect, receive, appropriate and realize upon Borrower's rights and interests in, to and under any Current Company IP Agreement, including in connection with any foreclosure or other exercise of the Collateral Agent's or any Lender's rights with respect thereto (including, for the avoidance of doubt, using reasonable best efforts to obtain the written consent of any counterparty to the exercise by the Collateral Agent or any Lender of any and all rights and remedies under this Agreement or any other Loan Document with respect to any Current Company IP Agreement, in form and substance reasonably satisfactory to the Collateral Agent).

8.2. Power of Attorney. Borrower hereby irrevocably appoints the Collateral Agent and any Related Party thereof as its lawful attorney-in-fact, exercisable upon the occurrence and during the continuance of an Event of Default, to: (a) endorse Borrower's name on any checks or other forms of payment or security; (b) sign Borrower's name on any invoice or bill of lading for any Account or drafts against Account Debtors; (c) settle and adjust disputes and claims about the Collateral Accounts directly with depository banks where the Collateral Accounts are maintained, for amounts and on terms the Collateral Agent determines reasonable; (d) make, settle, and adjust all claims under Borrower's products liability or

general liability insurance policies maintained in the United States regarding Collateral; (e) pay, contest or settle any Lien, charge, encumbrance, security interest, and adverse claim in or to the Collateral, or any judgment based thereon, or otherwise take any action to terminate or discharge the same; and (f) transfer the Collateral into the name of the Collateral Agent or a third party as the Code permits. Borrower hereby appoints the Collateral Agent and any Related Party thereof as its lawful attorney-in-fact to file or record any documents necessary to perfect or continue the perfection of the Collateral Agent's security interest in favor and for the benefit of Lenders and the other Secured Parties in the Collateral regardless of whether an Event of Default has occurred until all Obligations (other than inchoate indemnity obligations) have been satisfied in full and no Lender is under any further obligation to make Credit Extensions hereunder. The foregoing appointment of the Collateral Agent and any Related Party thereof as Borrower's attorney in fact, and all of the Collateral Agent's (or such Related Party's) rights and powers, coupled with an interest, are irrevocable until all Obligations (other than inchoate indemnity obligations) have been fully repaid and performed and each Lender's obligation to provide Credit Extensions terminates.

8.3. Application of Payments and Proceeds Upon Default. If an Event of Default has occurred and is continuing, the Collateral Agent shall apply any funds in its possession, whether from Borrower account balances, payments, proceeds realized as the result of any collection of Collateral Accounts or disposition of any other Collateral, or otherwise, to the Obligations in such order as the Collateral Agent shall determine in its sole discretion. Any surplus shall be paid to Borrower or other Persons legally entitled thereto; Borrower shall remain liable to Lenders for any deficiency. If the Collateral Agent or any Lender directly or indirectly enters into a deferred payment or other credit transaction with any purchaser at any sale of Collateral, the Collateral Agent or such Lender, as applicable, shall have the option, exercisable at any time, of either reducing the Obligations by the principal amount of the purchase price or deferring the reduction of the Obligations until the actual receipt by the applicable Lender(s) of cash therefor.

8.4. Collateral Agent's Liability for Collateral. So long as the Collateral Agent complies with Requirements of Law regarding the safekeeping of the Collateral in the possession or under the control of the Collateral Agent, the Collateral Agent shall not be liable or responsible for: (a) the safekeeping of the Collateral; (b) any loss or damage to the Collateral; or (c) any act or default of any other Person. In no event shall the Collateral Agent or any Lender have any liability for any diminution in the value of the Collateral for any reason. Borrower bears all risk of loss, damage or destruction of the Collateral.

8.5. No Waiver; Remedies Cumulative. The Collateral Agent's or any Lender's failure, at any time or times, to require strict performance by Borrower of any provision of this Agreement or any other Loan Document shall not waive, affect, or diminish any right of the Collateral Agent or any Lender thereafter to demand strict performance and compliance herewith or therewith. No waiver hereunder shall be effective unless signed by the party granting the waiver and then is only effective for the specific instance and purpose for which it is given. Each of the Collateral Agent's and Lender's rights and remedies under this Agreement and the other Loan Documents are cumulative. Each of the Collateral Agent and Lenders has all rights and remedies provided under the Code, by law, or in equity. The exercise by the Collateral Agent or any Lender of one right or remedy is not an election and shall not preclude the Collateral Agent or any Lender from exercising any other remedy under this Agreement or other remedy available at law or in equity, and the waiver by the Collateral Agent or any Lender of any Event of Default is not a continuing waiver. The Collateral Agent's or any Lender's delay in exercising any remedy is not a waiver, election, or acquiescence.

8.6. Demand Waiver; Makewhole Amount; Prepayment Premium. Borrower waives demand, notice of default or dishonor, notice of payment and nonpayment, notice of any default, nonpayment at maturity, release, compromise, settlement, extension, or renewal of accounts, documents, instruments, chattel paper, and guarantees held by the Collateral Agent on which Borrower is liable. Borrower acknowledges and agrees that if the maturity of all Obligations shall be accelerated pursuant to Section 8.1(a) by reason of the occurrence of an Event of Default, the Makewhole Amount or Prepayment Premium, as applicable, that is payable pursuant to Section 2.2(e) or Section 2.2(f), as the case may be, shall become due and payable by Borrower upon such acceleration, whether such acceleration is automatic or is effected by the Collateral Agent's or any Lender's declaration thereof, as provided in Section 8.1(a), and Borrower shall pay the Makewhole Amount or Prepayment Premium, as applicable, that is payable pursuant to Section 2.2(e) or Section 2.2(f), as the case may be, as compensation to Lenders for the loss of its investment opportunity and not as a penalty, and Borrower waives any right to object thereto in any voluntary or involuntary bankruptcy, insolvency or similar proceeding or otherwise.

9. NOTICES

All notices, consents, requests, approvals, demands, or other communication by any party to this Agreement or any other Loan Document must be in writing and shall be deemed to have been validly served, given, or delivered: (a) upon the earlier of actual receipt and three (3) Business Days after deposit in the U.S. mail, first class, registered or certified mail return receipt requested, with proper postage prepaid; (b) upon transmission, when sent by electronic mail or facsimile transmission; (c) one (1) Business Day after deposit with a reputable overnight courier with all charges prepaid; or (d) when delivered, if hand-delivered by messenger, all of which shall be addressed to the party to be notified and sent to the address, facsimile number, or email address (if any) indicated below. Any party to this Agreement may change its mailing or electronic mail address or facsimile number by giving all other parties hereto written notice thereof in accordance with the terms of this Section 9.

If to Borrower or any other Credit Party:

Akebia Therapeutics, Inc.
245 First Street
Cambridge, MA 02142
Attention: SVP, Chief Financial Officer
Telephone: (617) 871-2098
Email: [**]

with a copy to (which shall not constitute notice) to:

Akebia Therapeutics, Inc.
245 First Street
Cambridge, MA 02142
Attention: SVP, Chief Legal Officer
Telephone: [**]
Email: [**]

and

Latham & Watkins LLP
505 Montgomery Street, Suite 2000
San Francisco, CA 94111-6538
Attn: [**]
Telephone: [**]
Facsimile: [**]
Email: [**]

If to the Collateral Agent:

BioPharma Credit PLC
c/o Beaufort House
51 New North Road
Exeter EX4 4EP
United Kingdom
Attn: Company Secretary
Tel: [**]
Fax: [**]

with copies (which shall not constitute notice) to:

Pharmakon Advisors LP
110 East 59th Street, #3300
New York, NY 10022
Attn: [**]
Phone: [**]
Fax: [**]
Email: [**]

and

Akin Gump Strauss Hauer & Feld LLP
One Bryant Park
New York, NY 10036-6745
Attn: [**]
Phone: ([**]
Fax: [**]
Email: [**]

If to any Lender: To the address set forth on Exhibit E attached hereto.

10. CHOICE OF LAW, VENUE, AND []**

THE LOAN DOCUMENTS SHALL BE GOVERNED BY, AND CONSTRUED AND INTERPRETED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK, WITHOUT REGARD TO ANY PRINCIPLES OF CONFLICTS OF LAW THAT COULD REQUIRE THE APPLICATION OF THE LAW OF ANY OTHER JURISDICTION. Each party hereto submits to the exclusive jurisdiction of the courts of the State of New York sitting in New York County, and of the United States District Court of the Southern District of New York, and any appellate court from any thereof, and agrees that all claims in respect of any such action, litigation or proceeding may be heard and determined in such New York State court or, to the fullest extent permitted by Requirements of Law, in such Federal court; provided, however, that nothing in this Agreement shall be deemed to operate to preclude the Collateral Agent or any Lender from bringing suit or taking other legal action in any other jurisdiction to realize on the Collateral or any other security for the Obligations, or to enforce a judgment or other court order in favor of the Collateral Agent or any Lender. Each Credit Party expressly submits and consents in advance to such jurisdiction in any action or suit commenced in any such court, and each Credit Party hereby waives any objection that it may have based upon lack of personal jurisdiction, improper venue, or *forum non conveniens* and hereby consents to the granting of such legal or equitable relief as is deemed appropriate by such court. Each Credit Party hereby waives personal service of the summons, complaints, and other process issued in such action or suit and agrees that service of such summons, complaints, and other process may be made by registered or certified mail addressed to such party at the address set forth in (or otherwise provided in accordance with the terms of) Section 9 of this Agreement and that service so made shall be deemed completed upon the earlier to occur of such party's actual receipt thereof or three (3) days after deposit in the U.S. mails, proper postage prepaid.

[**]

11. GENERAL PROVISIONS

11.1. Successors and Assigns.

(a) This Agreement binds and is for the benefit of the parties hereto and their respective successors and permitted assigns.

(b) No Credit Party may transfer, pledge or assign this Agreement or any other Loan Document or any rights or obligations hereunder or thereunder without the prior written consent of each Lender. No Lender may at any time sell, transfer, assign or pledge this Agreement or any other Loan Document or any of its rights or obligations hereunder or thereunder, or grant a participation in all or any

part of, or any interest in, such Lender's obligations, rights or benefits under this Agreement and the other Loan Documents, including with respect to any Term Loan (or any portion thereof), to any third party without Borrower's prior written consent, not to be unreasonably withheld, delayed or conditioned (any such sale, transfer, assignment, pledge or grant of a participation, a "**Lender Transfer**"); provided, however, that **[**]** without Borrower's consent; provided, further, that **[**]**. For the avoidance of doubt, no Lender may make a Lender Transfer to any **[**]** without the prior written consent of Borrower.

(c) In the case of a Lender Transfer in the form of a participation granted by any Lender to any third party, (i) such Lender's obligations under this Agreement shall remain unchanged, (ii) such Lender shall remain solely responsible to the other parties hereto for the performance of its obligations hereunder, (iii) Borrower shall continue to deal solely and directly with such Lender in connection with such Lender's rights and obligations under this Agreement and (iv) any agreement or instrument pursuant to which such Lender sells such participation shall provide that such Lender shall retain the sole right to enforce this Agreement and to approve any amendment, modification, or other modification hereto, in each case subject to the terms and conditions of this Agreement. Borrower agrees that each participant shall be entitled to the benefits of Sections 2.5 and 2.6 (subject to the requirements and limitations therein, including the requirements under Section 2.6(d) (it being understood that the documentation required under Section 2.6(d) shall be delivered to the applicable Lender)) to the same extent as if it were a Person that had acquired its interest by assignment pursuant to clause (b) above; provided that, with respect to any participation, such participant shall not be entitled to receive any greater payment under Sections 2.5 or 2.6 than the applicable Lender (i.e., the party that participated the interest) would have been entitled to receive, except to the extent of any entitlement to receive a greater payment resulting from a Change in Law that occurs after such participant acquired the applicable participation.

(d) The Collateral Agent shall record any Lender Transfer in the Register. Each Lender shall provide Borrower and the Collateral Agent with written notice of a Lender Transfer delivered no later than **[**]** to the date on which such Lender Transfer is consummated. For the avoidance of doubt, if any Lender **[**]**, such Lender shall, acting solely for this purpose as a non-fiduciary agent of Borrower, maintain a register on which it enters the name and address of each participant and principal amounts (and stated interest) of each participant's interest in the Term Loan(s) or other obligations under the Loan Documents (the "**Participant Register**"); provided, however, that such Lender shall have no obligation to disclose all or any portion of the Participant Register (including the identity of any participant or any information relating to a participant's interest in any commitments, loans or its other obligations under any Loan Document) to any Person except to the extent that such disclosure is necessary to establish that such commitment, loan, letter of credit or other obligation is in registered form under Section 5f.103-1(c) or Proposed Section 1.163-5(b) of the Treasury Regulations (or, in each case, any amended or successor version). The entries in the Participant Register shall be conclusive absent manifest error, and the Collateral Agent and each Lender shall treat each Person whose name is recorded in the Participant Register as the owner of such participation for all purposes of this Agreement notwithstanding any notice to the contrary.

(e) Any attempted transfer, pledge or assignment of this Agreement or any other Loan Document or any rights or obligations hereunder or thereunder in violation of this Section 11.1 shall be null and void *ab initio* and of no effect.

11.2. Indemnification; Expenses Incurred by Credit Parties.

(a) Borrower agrees to indemnify and hold harmless each of the Collateral Agent, Lenders and its and their respective Affiliates (and its or their respective successors and assigns) and each manager, member, partner, controlling Person, director, officer, employee, agent or sub-agent, advisor and affiliate thereof (each such Person, an "**Indemnified Person**") from and against any and all Indemnified Liabilities; provided, however, that (i) Borrower shall have no obligation to any Indemnified Person hereunder with respect to any Indemnified Liabilities to the extent such Indemnified Liabilities arise from the bad faith, gross negligence or willful misconduct of that Indemnified Person (or its Affiliates or controlling Persons or their respective directors, officers, managers, partners, members, agents, sub-agents or advisors), in each case, as determined by a final, non-appealable judgment of a court of competent jurisdiction, (ii) Borrower shall have no obligation to any Indemnified Person hereunder with respect to any Indemnified Liabilities to the extent such Indemnified Liabilities arise from a material breach of any

obligation of such Indemnified Person hereunder, and (iii) Borrower shall have no obligation to any Indemnified Person hereunder with respect to any Indemnified Liabilities to the extent such Indemnified Liabilities arise from any claim by one Indemnified Person against another Indemnified Person that does not relate to any act or omission of any Credit Party, and (iv) no Credit Party shall be liable for any settlement of any claim or proceeding effected by any Indemnified Person without the prior written consent of such Credit Party (which consent shall not be unreasonably withheld or delayed), but if settled with such consent or if there shall be a final judgment against an Indemnified Person, each of the Credit Parties shall, jointly and severally, indemnify and hold harmless such Indemnified Person from and against any loss or liability by reason of such settlement or judgment in the manner set forth in this Agreement. This Section 11.2(a) shall not apply with respect to Taxes other than any Taxes that represent liabilities, obligations, losses, damages, penalties, claims, costs, expenses and disbursements arising from any non-Tax claim.

(b) To the extent permitted by Requirements of Law, no party to this Agreement shall assert, and each party to this Agreement hereby waives, any claim against any other party hereto (and its or their successors and assigns), and each manager, member, partner, controlling Person, director, officer, employee, agent or sub-agent, advisor and affiliate thereof, on any theory of liability, for special, indirect, consequential or punitive damages (as opposed to direct or actual damages) (whether or not the claim therefor is based on contract, tort or duty imposed by any applicable legal requirement) arising out of, in connection with, arising out of, as a result of, or in any way related to, this Agreement or any Loan Document or any agreement or instrument contemplated hereby or thereby or referred to herein or therein, the transactions contemplated hereby or thereby, the Term Loans or the use of the proceeds thereof or any act or omission or event occurring in connection therewith, and each party to this Agreement hereby waives, releases and agrees not to sue upon any such claim or any such damages, whether or not accrued and whether or not known or suspected to exist in its favor.

(c) Any action taken by any Credit Party under or with respect to any Loan Document, even if required under any Loan Document or at the request of the Collateral Agent or any Lender, shall be at the expense of such Credit Party, and neither the Collateral Agent nor any Secured Party shall be required under any Loan Document to reimburse any Credit Party or any Subsidiary of any Credit Party therefor except as expressly provided therein.

11.3. Severability of Provisions. In case any provision in or obligation hereunder or under any other Loan Document shall be invalid, illegal or unenforceable in any jurisdiction, the validity, legality and enforceability of the remaining provisions or obligations, or of such provision or obligation in any other jurisdiction, shall not in any way be affected or impaired thereby.

11.4. Correction of Loan Documents. The Collateral Agent or Required Lenders may correct patent errors and fill in any blanks in the Loan Documents consistent with the agreement of the parties hereto so long as the Collateral Agent or Required Lenders, as applicable, provides the Credit Parties and the other parties hereto with written notice of such correction and allows the Credit Parties at least ten (10) days to object to such correction in writing delivered to the Collateral Agent and each Lender. In the event of such objection, such correction shall not be made except by an amendment to this Agreement in accordance with Section 11.5.

11.5. Amendments in Writing; Integration.

(a) No amendment, restatement or modification of any provision of this Agreement or any other Loan Document, or waiver, discharge or termination of any obligation hereunder or thereunder, no approval or consent hereunder or thereunder (including any consent to any departure by Borrower or any other Credit Party herefrom or therefrom), shall in any event be effective unless the same shall be in writing and signed by Borrower (on its own behalf and on behalf of each other Credit Party) and the Required Lenders; provided, however, that no such amendment, restatement, modification, waiver, discharge, termination, approval or consent shall, unless in writing and signed by the Collateral Agent and the Required Lenders, affect the rights or duties of, or any amounts payable to, the Collateral Agent under this Agreement or any other Loan Document. Any such waiver, approval or consent granted shall be limited to the specific circumstance expressly described in it, and shall not apply to any subsequent or other circumstance, whether similar or dissimilar, or give rise to, or evidence, any obligation or commitment to grant any further waiver, approval or consent.

(b) This Agreement and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations among the parties hereto about the subject matter of this Agreement and the Loan Documents merge into this Agreement and the Loan Documents.

11.6. Counterparts. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, is an original, and all taken together, constitute one Agreement.

11.7. Survival. All covenants, representations and warranties made in this Agreement continue in full force until this Agreement has terminated pursuant to its terms and all Obligations (other than inchoate indemnity obligations and any other obligations which, by their terms, are to survive the termination of this Agreement) have been paid in full and satisfied. The obligation of Borrower or any other the Credit Parties in Section 11.2 to indemnify Indemnified Persons shall survive until the statute of limitations with respect to such claim or cause of action shall have run.

11.8. Confidentiality. Any information regarding the Credit Parties and their Subsidiaries and their businesses provided to the Collateral Agent or any Lender by or on behalf of any Credit Party pursuant to the Loan Documents shall be deemed "Confidential Information"; provided, however, that Confidential Information does not include information that is either: (i) in the public domain or in the possession of the Collateral Agent, any Lender or any of their respective Affiliates or when disclosed to the Collateral Agent, any Lender or any of their respective Affiliates, or becomes part of the public domain after disclosure to the Collateral Agent, any Lender or any of their respective Affiliates, in each case, other than as a result of a breach by the Collateral Agent, any Lender or any of their respective Affiliates of the obligations under this Section 11.8; or (ii) disclosed to the Collateral Agent, any Lender or any of their respective Affiliates by a third party if the Collateral Agent, such Lender or such Affiliate, as applicable, does not know that the third party is prohibited from disclosing the information. Neither the Collateral Agent nor any Lender shall disclose any Confidential Information to a third party or use Confidential Information for any purpose other than the exercise of its rights and the performance of its duties or obligations under the Loan Documents. The foregoing in this Section 11.8 notwithstanding, the Collateral Agent and each Lender may disclose Confidential Information: (a) to any of its Subsidiaries or Affiliates; (b) to prospective transferees or purchasers of any interest in the Credit Extensions (including, for the avoidance of doubt, in connection with any proposed Lender Transfer); (c) as required by law, regulation, subpoena, or other order, provided, that (x) prior to any disclosure under this clause (c), the Collateral Agent or such Lender, as applicable, agrees to endeavor to provide Borrower with prior written notice thereof and with respect to any law, regulation, subpoena or other order, to the extent that the Collateral Agent or such Lender is permitted to provide such prior notice to Borrower pursuant to the terms hereof, and (y) any disclosure under this clause (c) shall be limited solely to that portion of the Confidential Information as may be specifically compelled by such law, regulation, subpoena or other order; (d) to the extent requested by regulators having jurisdiction over the Collateral Agent or such Lender or as otherwise required in connection with the Collateral Agent's or such Lender's examination or audit by such regulators; (e) as the Collateral Agent or such Lender considers reasonably necessary in exercising remedies under the Loan Documents; (f) to third-party service providers of the Collateral Agent or such Lender; and (g) to any of the Collateral Agent's or such Lender's Related Parties; provided, however, that the third parties to which Confidential Information is disclosed pursuant to clauses (a), (b), (f) and (g) are bound by obligations of confidentiality and non-use that are no less restrictive than those contained herein.

The provisions of this Section 11.8 shall survive the termination of this Agreement.

11.9. Attorneys' Fees, Costs and Expenses. In any action or proceeding between any Credit Party and the Collateral Agent or any Lender arising out of or relating to the Loan Documents, the prevailing party shall be entitled to recover its reasonable attorneys' fees and other costs and expenses incurred, in addition to any other relief to which it may be entitled.

11.10. Right of Set-Off. In addition to any rights now or hereafter granted under Requirements of Law and not by way of limitation of any such rights, upon the occurrence of an Event of Default and at any time thereafter during the continuance of any Event of Default, each Lender is hereby authorized by each Credit Party at any time or from time to time, without prior notice to any Credit Party, any such notice being hereby expressly waived by Borrower (on its own behalf and on behalf of each other Credit Party), to set off and to appropriate and to apply any and all deposits (general or special, including Indebtedness evidenced by certificates of deposit, whether matured or unmatured, but not including trust accounts) and any other Indebtedness at any time held or owing by such Lender to or for the credit or the account of any Credit Party against and on account of the obligations and liabilities of any Credit Party to such Lender hereunder and under the other Loan Documents, including all claims of any nature or description arising out of or connected hereto or with any other Loan Document, irrespective of whether or not (a) the Collateral Agent or such Lender shall have made any demand hereunder or (b) the principal of or the interest on the Term Loans or any other amounts due hereunder shall have become due and payable pursuant to Section 2 and although such obligations and liabilities, or any of them, may be contingent or unmatured. Each Lender agrees promptly to notify Borrower and the Collateral Agent after any such set off and application made by such Lender; provided, that the failure to give such notice shall not affect the validity of such set off and application.

11.11. Marshalling; Payments Set Aside. Neither the Collateral Agent nor any Lender shall be under any obligation to marshal any assets in favor of any Credit Party or any other Person or against or in payment of any or all of the Obligations. To the extent that any Credit Party makes a payment or payments to any Lender, or the Collateral Agent or any Lender enforces any Liens or exercises its rights of setoff, and such payment or payments or the proceeds of such enforcement or setoff or any part thereof are subsequently invalidated, declared to be fraudulent or preferential, set aside or required to be repaid to a trustee, receiver or any other party under any bankruptcy law, any other state or federal law, common law or any equitable cause, then, to the extent of such recovery, the obligation or part thereof originally intended to be satisfied, and all Liens, rights and remedies therefor or related thereto, shall be revived and continued in full force and effect as if such payment or payments had not been made or such enforcement or setoff had not occurred.

11.12. Electronic Execution of Documents. The words “execution,” “signed,” “signature” and words of like import in any Loan Document shall be deemed to include electronic signatures or the keeping of records in electronic form, each of which shall be of the same legal effect, validity and enforceability as a manually executed signature or the use of a paper-based recordkeeping systems, as the case may be, to the extent and as provided for in any Requirements of Law, including any state law based on the Uniform Electronic Transactions Act.

11.13. Captions. Section headings herein are included herein for convenience of reference only and shall not constitute a part hereof for any other purpose or be given any substantive effect.

11.14. Construction of Agreement. The parties hereto mutually acknowledge that they and their respective attorneys have participated in the preparation and negotiation of this Agreement. In cases of uncertainty, this Agreement shall be construed without regard to which of the parties hereto caused the uncertainty to exist.

11.15. Third Parties. Nothing in this Agreement, whether express or implied, is intended to: (a) except as expressly provided in Section 11.2(a), confer any benefits, rights or remedies under or by reason of this Agreement on any Persons other than the express parties to it and their respective successors and permitted assigns; (b) relieve or discharge the obligation or liability of any Person not an express party to this Agreement; or (c) give any Person not an express party to this Agreement any right of subrogation or action against any party to this Agreement.

11.16. No Advisory or Fiduciary Duty. The Collateral Agent and each Lender may have economic interests that conflict with those of the Credit Parties. Each Credit Party agrees that nothing in the Loan Documents or otherwise will be deemed to create an advisory, fiduciary or agency relationship or fiduciary or other implied duty between any Lender or the Collateral Agent, on the one hand, and such Credit Party, its Subsidiaries, and any of their respective stockholders or affiliates, on the other hand. Each Credit Party acknowledges and agrees that (i) the transactions contemplated by the Loan Documents are arm's-

length commercial transactions between each Lender and the Collateral Agent, on the one hand, and such Credit Party, its Subsidiaries and their respective affiliates, on the other hand, (ii) in connection therewith and with the process leading to such transaction, the Collateral Agent and each Lender is acting solely as a principal and not the advisor, agent or fiduciary of such Credit Party, its Subsidiaries or their respective affiliates, management, stockholders, creditors or any other Person, (iii) Neither the Collateral Agent nor any Lender has assumed an advisory or fiduciary responsibility in favor of any Credit Party, its Subsidiaries or their respective affiliates with respect to the transactions contemplated hereby or the process leading thereto (irrespective of whether the Collateral Agent or any Lender or any of their respective affiliates has advised or is currently advising such Credit Party, its Subsidiaries or their respective affiliates on other matters) or any other obligation to such Credit Party, its Subsidiaries or their respective affiliates except the obligations expressly set forth in the Loan Documents and (iv) each Credit Party, its Subsidiaries and their respective affiliates have consulted their own legal and financial advisors to the extent each deemed appropriate. Each Credit Party further acknowledges and agrees that it is responsible for making its own independent judgment with respect to such transactions and the process leading thereto. Each Credit Party agrees that it will not claim that the Collateral Agent or any Lender has rendered advisory services of any nature or respect, or owes a fiduciary or similar duty to such Credit Party, its Subsidiaries or their respective affiliates in connection with such transaction or the process leading thereto.

11.17. Other Assets. Notwithstanding anything to the contrary herein or in any other Loan Document (including under Section 5, Section 6, the Security Agreement or otherwise):

(a) No covenant or other provision shall limit the ability any Credit Party or any Subsidiary to dispose of, transfer, monetize, lease, license, encumber, secure, finance or enter into any other program or transaction solely with respect to any of the Other Assets (which, for the avoidance of doubt, are Excluded Property). Each Credit Party may [**].

(b) Any Credit Party or any of their Subsidiaries may [**]; provided, however, that any [**]paid, remitted, transferred or otherwise deposited and held in Collateral Accounts subject to a Control Agreement or other appropriate instrument to perfect the Collateral Agent's Lien in favor and for the benefit of Lenders and the other Secured Parties in such Collateral Account in accordance with the terms hereunder (in form and substance reasonably satisfactory to the Collateral Agent).

(c) Any Credit Party may enter into documentation reasonably necessary in connection with consummating any of the foregoing in this Section 11.17, and Collateral Agent and the Lenders will take any commercially reasonable steps, including any releases if necessary, reasonably requested by any Credit Party to permit the consummation of any of the foregoing in this Section 11.17, in each case at such Credit Party's sole expense.

12. COLLATERAL AGENT

12.1. Appointment and Authority. Each of the Lenders hereby irrevocably appoints BioPharma Credit PLC to act on its behalf as the Collateral Agent hereunder and under the other Loan Documents and authorizes the Collateral Agent to take such actions on its behalf and to exercise such powers as are delegated to the Collateral Agent by the terms hereof or thereof, together with such actions and powers as are reasonably incidental thereto. Except for the first three (3) sentences of Section 12.6 and the last paragraph of Section 12.8, the provisions of this Section 12 are solely for the benefit of the Collateral Agent and the Lenders, and neither Borrower nor any other Credit Party shall have rights as a third party beneficiary of any of such provisions. Subject to Section 12.8 and Section 11.5, any action required or permitted to be taken by the Collateral Agent hereunder shall be taken with the prior approval of the Required Lenders.

12.2. Rights as a Lender. The Person serving as the Collateral Agent hereunder shall have the same rights and powers in its capacity as a Lender as any other Lender and may exercise the same as though it were not the Collateral Agent and the term "Lender" or "Lenders" shall, unless otherwise expressly indicated or unless the context otherwise requires, include the Person serving as the Collateral Agent hereunder in its individual capacity. Such Person and its Affiliates may lend money to, own securities of, act as the financial advisor or in any other advisory capacity for and generally engage in any kind of business with Borrower or any Subsidiary or other Affiliate thereof as if such Person were not the Collateral Agent hereunder and without any duty to account therefor to the Lenders.

12.3. Exculpatory Provisions.

(a) The Collateral Agent shall not have any duties or obligations to the Lenders except those expressly set forth herein and in the other Loan Documents to which it is a party. Without limiting the generality of the foregoing, with respect to the Lenders, the Collateral Agent:

(i) shall not be subject to any fiduciary or other implied duties, regardless of whether a Default or Event of Default has occurred and is continuing;

(ii) shall not have any duty to take any discretionary action or exercise any discretionary powers, except discretionary rights and powers expressly contemplated hereby or by the other Loan Documents to which it is a party that the Collateral Agent is required to exercise as directed in writing by the Required Lenders (or such other number or percentage of the Lenders as shall be expressly provided for herein or in such other Loan Documents), provided that the Collateral Agent shall not be required to take any action that, in its opinion or the opinion of its counsel, may expose the Collateral Agent to liability or that is contrary to any Loan Document or Requirements of Law; and

(iii) shall not, except as expressly set forth herein and in the other Loan Documents to which it is a party, have any duty to disclose, and shall not be liable for the failure to disclose, any information relating to Borrower or any of its Affiliates that is communicated to or obtained by the Person serving as the Collateral Agent or any of its Affiliates in any capacity.

(b) The Collateral Agent shall not be liable for any action taken or not taken by it (i) with the consent or at the request of the Required Lenders (or such other number or percentage of the Lenders as shall be necessary, or as the Collateral Agent shall believe in good faith shall be necessary, under the circumstances as provided in Section 11.5) or (ii) in the absence of its own gross negligence or willful misconduct as determined by a court of competent jurisdiction by final and nonappealable judgment. The Collateral Agent shall be deemed not to have knowledge of any Default or Event of Default unless and until notice describing such Default or Event of Default is given to the Collateral Agent in writing by Borrower or a Lender.

(c) The Collateral Agent shall not be responsible for or have any duty to ascertain or inquire into (i) any statement, warranty or representation made in or in connection with this Agreement or any other Loan Document, (ii) the contents of any certificate, report or other document delivered hereunder or thereunder or in connection herewith or therewith, (iii) the performance or observance of any of the covenants, agreements or other terms or conditions set forth herein or therein or the occurrence of any Default or Event of Default, (iv) the validity, enforceability, effectiveness or genuineness of this Agreement, any other Loan Document or any other agreement, instrument or document or (v) the satisfaction of any condition set forth in Section 3 or elsewhere herein, other than to confirm receipt of items expressly required to be delivered to the Collateral Agent.

12.4. Reliance by Collateral Agent. The Collateral Agent shall be entitled to rely upon, and shall not incur any liability for relying upon, any notice, request, certificate, consent, statement, instrument, document or other writing (including any electronic message, internet or intranet website posting or other distribution) believed by it to be genuine and to have been signed, sent or otherwise authenticated by the proper Person. The Collateral Agent also may rely upon any statement made to it orally or by telephone and believed by it to have been made by the proper Person, and shall not incur any liability for relying thereon. The Collateral Agent may consult with legal counsel (who may be counsel for Borrower), independent accountants and other experts selected by it, and shall not be liable for any action taken or not taken by it in accordance with the advice of any such counsel, accountants or experts.

12.5. Delegation of Duties. The Collateral Agent may perform any and all of its duties and exercise its rights and powers hereunder or under any other Loan Document by or through any one or more sub-agents appointed by the Collateral Agent. The Collateral Agent and any such sub-agent may perform any and all of its duties and exercise its rights and powers by or through their respective Related Parties. The exculpatory provisions of this Section 12 shall apply to any such sub-agent and to the Related Parties of the Collateral Agent and any such sub-agent. The Collateral Agent shall not be responsible for the negligence or misconduct of any sub-agent except to the extent that a court of competent jurisdiction determines in a final and nonappealable judgment that the Collateral Agent acted with gross negligence or willful misconduct in the selection of such sub-agent.

12.6. Resignation of Collateral Agent. The Collateral Agent may at any time give notice of its resignation to the Lenders and Borrower. Upon the receipt of any such notice of resignation, the Required Lenders shall have the right, with Borrower's prior written consent (such consent not to be unreasonably withheld, conditioned or delayed) so long as no Default has occurred and is continuing and no Event of Default has occurred, to appoint a successor; provided, however, that Borrower's consent shall not be required in the case of any such appoint of a Pharmakon Lender or any Related Party of a Pharmakon Lender. If no successor shall have been so appointed by the Required Lenders and shall have accepted such appointment within thirty (30) days after the retiring Collateral Agent gives notice of its resignation, then the retiring Collateral Agent may, on behalf of the Lenders, with Borrower's prior written consent so long as no Default has occurred and is continuing and no Event of Default has occurred, appoint a successor Collateral Agent; provided, however, that Borrower's consent shall not be required in the case of any such appoint of a Pharmakon Lender or any Related Party of a Pharmakon Lender; provided, further, that, whether or not a successor has been appointed or has accepted such appointment, such resignation shall become effective upon delivery of the notice thereof. Upon the acceptance of a successor's appointment as Collateral Agent hereunder, such successor shall succeed to and become vested with all of the rights, powers, privileges and duties of the retiring (or retired) Collateral Agent, and the retiring Collateral Agent shall be discharged from all of its duties and obligations under the Loan Documents (if not already discharged therefrom as provided above in this Section 12.6). After the retiring Collateral Agent's resignation, the provisions of this Section 12 and Section 10 shall continue in effect for the benefit of such retiring Collateral Agent, its sub-agents and their respective Related Parties in respect of any actions taken or omitted to be taken by any of them while the retiring Collateral Agent was acting as Collateral Agent. Upon any resignation by the Collateral Agent, all payments, communications and determinations provided to be made by, to or through the Collateral Agent shall instead be made by, to or through each Lender directly, until such time as a Person accepts an appointment as Collateral Agent in accordance with this Section 12.6.

12.7. Non-Reliance on Collateral Agent and Other Lenders. Each Lender acknowledges that it has, independently and without reliance upon the Collateral Agent or any other Lender or any of their respective Related Parties and based on such documents and information as it has deemed appropriate, made its own credit analysis and decision to enter into this Agreement and make Credit Extensions hereunder. Each Lender also acknowledges that it will, independently and without reliance upon the Collateral Agent or any other Lender or any of their respective Related Parties and based on such documents and information as it shall from time to time deem appropriate, continue to make its own decisions in taking or not taking action under or based upon this Agreement, any other Loan Document or any related agreement or any document furnished hereunder or thereunder.

12.8. Collateral and Guaranty Matters. Each Lender agrees that any action taken by the Collateral Agent or the Required Lenders in accordance with the provisions of this Agreement or of the other Loan Documents, and the exercise by the Collateral Agent or Required Lenders of the powers set forth herein or therein, together with such other powers as are reasonably incidental thereto, shall be authorized and binding upon all of the Lenders. Without limiting the generality of the foregoing, the Lenders irrevocably authorize the Collateral Agent, at its option and in its discretion, and the Collateral Agent agrees, upon the written request of Borrower:

(a) to release any Lien on any property granted to or held by the Collateral Agent under any Collateral Document (i) upon payment in full of the Obligations (other than unasserted inchoate indemnity obligations), (ii) that is sold, transferred, disposed or to be sold, transferred, disposed as part of or in connection with any sale, transfer or other disposition (other than any sale to a Credit Party) permitted hereunder, (iii) subject to Section 11.5, if approved, authorized or ratified in writing by the Required Lenders, (iv) to the extent such property is owned by a Guarantor upon the release of such Guarantor from its obligations under the Loan Documents pursuant to clause (c) below, or (v) in the event this Loan Agreement and all other Loan Documents are terminated pursuant to the ultimate sentence in Section 3.1 hereof;

(b) to subordinate any Lien on any property granted to or held by the Collateral Agent under any Loan Document to the holder of any Lien on such property that is permitted by clause (d), (i), (j), (m), (n) and (r) of the definition of "Permitted Liens" (solely with respect to modifications, replacements, extensions or renewals of Liens permitted under clause (d), (i), (j), (m) and (n) of the definition of "Permitted Liens");

(c) to release any Guarantor from its obligations under the Loan Documents if such Person ceases to be a Subsidiary as a result of a transaction permitted hereunder or upon payment in full of the Obligations (other than unasserted inchoate indemnity obligations) or in the event this Loan Agreement and all other Loan Documents are terminated pursuant to the ultimate sentence in Section 3.1 hereof;

(d) to enter into non-disturbance and similar agreements in connection with the licensing of Intellectual Property permitted pursuant to the terms of this Agreement; and

(e) to enter into a subordination, intercreditor, or other similar agreement with respect to any Indebtedness that constitutes Subordinated Debt to the extent such Subordinated Debt is permitted under the definition of "Permitted Indebtedness".

Upon request by the Collateral Agent at any time the Required Lenders will confirm in writing the Collateral Agent's authority to release or subordinate its interest in particular types or items of property, or to release any Guarantor from its obligations under the Security Agreement pursuant to this Section 12.8.

In each case as specified in this Section 12.8, the Collateral Agent will (and each Lender irrevocably authorizes the Collateral Agent to), at Borrower's expense, execute and deliver to the applicable Credit Party such documents as such Credit Party may reasonably request (i) to evidence the release or subordination of such item of Collateral from the Liens and security interests granted under the Collateral Documents, (ii) to enter into non-disturbance or similar agreements in connection with the licensing of Intellectual Property, (iii) to enter into a subordination, intercreditor, or other similar agreement with respect to any Indebtedness that constitutes Subordinated Debt to the extent such Subordinated Debt is permitted under the definition of "Permitted Indebtedness" or (iv) to evidence the release of any Guarantor from its obligations under the Loan Documents, in each case in accordance with the terms of the Loan Documents and this Section 12.8 and in form and substance reasonably acceptable to the Collateral Agent.

Without limiting the generality of Section 12.10 below, the Collateral Agent shall deliver to the Lenders notice of any action taken by it under this Section 12.8 promptly after the taking thereof; provided that delivery of or failure to deliver any such notice shall not affect the Collateral Agent's rights, powers, privileges and protections under this Section 12.

12.9. Reimbursement by Lenders. To the extent that Borrower for any reason fails to indefeasibly pay any amount required under Section 2.4 to be paid by it to the Collateral Agent (or any sub-agent thereof) or any Related Party of any of the foregoing, each Lender severally agrees to pay to the Collateral Agent (or any such sub-agent) or such Related Party, as the case may be, such Lender's *pro rata* share (based upon the percentages as used in determining the Required Lenders as of the time that the applicable unreimbursed expense or indemnity payment is sought) of such unpaid amount; provided that the unreimbursed expense or indemnified loss, damage, liability or related expense, as the case may be, was incurred by or asserted against the Collateral Agent (or any such sub-agent) in its capacity as such or against any Related Party of any of the foregoing acting for the Collateral Agent (or any sub-agent) in connection with such capacity.

12.10. Notices and Items to Lenders. The Collateral Agent shall deliver to the Lenders each notice, report, statement, approval, direction, consent, exemption, authorization, waiver, certificate, filing or other item received by it pursuant to this Agreement or any other Loan Document (including any item received by it pursuant to Section 3 or set forth on Schedule 5.14 of the Disclosure Letter); provided, that any delivery of or failure to deliver any such notice, report, statement, approval, direction, consent, exemption, authorization, waiver, certificate, filing or item shall not otherwise alter or effect the rights of the Lenders or the Collateral Agent under this Agreement or any other Loan Document or the validity of such item. In addition, to the extent the Collateral Agent or the Required Lenders deliver any notices, approvals, authorizations, directions, consents or waivers to Borrower pursuant to this Agreement or any other Loan Document, the Collateral Agent or the Required Lenders, as applicable, will also deliver such notice, approval, authorization, direction, consent or waiver to the other Lenders on or about the same time such notice, approval, authorization, direction, consent or waiver is provided to Borrower; provided, that the delivery of or failure to deliver such notice, approval, authorization, direction, consent or waiver to the other Lenders shall not in any way effect the obligations of Borrower, or the rights of the Collateral Agent or the Required Lenders, in respect of such notice, approval, authorization, direction, consent or waiver or the validity thereof.

13. DEFINITIONS

13.1. Definitions. For the purposes of and as used in the Loan Documents: (a) references to any Person include its successors and assigns and, in the case of any Governmental Authority, any Person succeeding to its functions and capacities; (b) except as the context otherwise requires (including to the extent otherwise expressly provided in any Loan Document), (i) references to any law, statute, treaty, order, policy, rule or regulation include any amendments, supplements and successors thereto and (ii) references to any contract, agreement, instrument or other document include any amendments, restatements, supplements or modifications thereto or thereof from time to time to the extent permitted by the provisions thereof; (c) the word “shall” is mandatory; (d) the word “may” is permissive; (e) the word “or” has the inclusive meaning represented by the phrase “and/or”; (f) the words “include”, “includes” and “including” are not limiting; (g) the singular includes the plural and the plural includes the singular; (h) numbers denoting amounts that are set off in parentheses are negative unless the context dictates otherwise; (i) each authorization herein shall be deemed irrevocable and coupled with an interest; (j) all accounting terms shall be interpreted, and all determinations relating thereto shall be made, in accordance with Applicable Accounting Standards; (k) references to any time of day shall be to New York time; (l) the words “herein”, “hereof”, “hereby”, “hereto” and “hereunder” refer to this Agreement as a whole; and (m) unless otherwise expressly provided, references to specific sections, articles, clauses, sub-clauses, annexes and exhibits are to this Agreement and references to specific schedules are to the Disclosure Letter. As used in this Agreement, the following capitalized terms have the following meanings:

“**Account**” means any “account” as defined in the Code with such additions to such term as may hereafter be made, and includes all accounts receivable, book debts, and other sums owing to Credit Parties.

“**Account Debtor**” means any “account debtor” as defined in the Code with such additions to such term as may hereafter be made.

“**Acquisition**” means (a) any Stock Acquisition, or (b) any Asset Acquisition.

“**Additional Consideration**” is defined in Section 2.7.

“**Adverse Proceeding**” means any action, suit, proceeding, hearing (whether administrative, judicial or otherwise), governmental investigation or arbitration (whether or not purportedly on behalf of any Credit Party or any of its Subsidiaries) at law or in equity, or before or by any Governmental Authority, domestic or foreign (including any Environmental Claims), whether [**] against or adversely affecting any Credit Party or any of its Subsidiaries or any property of any Credit Party or any of its Subsidiaries.

“**Affiliate**” means, with respect to any Person, each other Person that owns or controls directly or indirectly the Person, any Person that controls or is controlled by or is under common control with the Person, and each of that Person’s senior executive officers, directors, partners and, for any Person that is a limited liability company or limited liability partnership, that Person’s managers and members. As used in this definition, “control” means (a) direct or indirect beneficial ownership of at least fifty percent (50%) (or such lesser percentage which is the maximum allowed to be owned by a foreign corporation in a particular jurisdiction) of the voting share capital or other equity interest in a Person or (b) the power to direct or cause the direction of the management of such Person by contract or otherwise. In no event shall the Collateral Agent or any Lender be deemed to be an Affiliate of Borrower or any of its Subsidiaries.

“**Agreement**” is defined in the preamble hereof.

“**Amortization Reduction Days**” means the number of days equal to the difference of (a) the Term Loan Maturity Date *minus* (b) the [**]; provided, that Amortization Reduction Days shall equal [**] if the [**] are met; provided, further, that in no case shall the Amortization Reduction Days be greater than [**].

“**Anti-Money Laundering Laws**” is defined in Section 4.18(b).

“**Anti-Terrorism Laws**” means any Anti-Money Laundering Laws or other laws relating to terrorism or money laundering, including Executive Order No. 13224 (effective September 24, 2001), the Patriot Act, the laws comprising or implementing the Bank Secrecy Act, and the laws administered by OFAC.

“Applicable Accounting Standards” means with respect to Borrower and its Subsidiaries, generally accepted accounting principles in the United States as set forth in the opinions and pronouncements of the Accounting Principles Board of the American Institute of Certified Public Accountants and statements and pronouncements of the Financial Accounting Standards Board or in such other statements by such other Person as may be approved by a significant segment of the accounting profession, which are applicable to the circumstances as of the date of determination, consistently applied.

“Applicable Percentage” means, with respect to each Lender at any time of determination, the percentage equal to a fraction, the numerator of which is the amount of such Lender’s Term Loan Commitment and the denominator of which is an amount equal to the aggregate principal of the Term Loans at such time.

“Asset Acquisition” means, with respect to Borrower or any of its Subsidiaries, any [**] acquisition of any properties or assets [**] of any other Person (including any purchase or other acquisition of any [**] such Person). For the avoidance of doubt, “Asset Acquisition” includes [**].

“Bankruptcy Code” means Title 11 of the United States Code entitled “Bankruptcy,” as now and hereafter in effect, or any successor statute.

“Blocked Person” means (a) any Person listed in the annex to, or is otherwise subject to the provisions of, Executive Order No. 13224, (b) a Person fifty percent (50%) or more owned by, or acting for or on behalf of, any Person that is listed in the annex to, or is otherwise subject to the provisions of, Executive Order No. 13224, (c) a Person with which the Collateral Agent or any Lender is prohibited from dealing or otherwise engaging in any transaction by any Anti-Terrorism Law, (d) a Person that commits, threatens or conspires to commit or supports “terrorism” as defined in Executive Order No. 13224, or (e) a Person that is named a “specially designated national” or “blocked person” on the most current list published by OFAC or other similar list.

“Board of Directors” means, with respect to any Person, (i) in the case of any corporation, the board of directors of such Person, (ii) in the case of any limited liability company, the board of managers of such Person, or if there is none, the Board of Directors of the managing member of such Person, (iii) in the case of any partnership, the Board of Directors of the general partner of such Person and (iv) in any other case, the functional equivalent of the foregoing.

“Board of Governors” means the Board of Governors of the United States Federal Reserve System, or any successor thereto.

“Books” means all books and records including ledgers, records regarding a Credit Party’s assets or liabilities, the Collateral, business operations or financial condition, and all computer programs or storage or any equipment containing such information.

“Borrower” is defined in the preamble hereof.

“Borrowing Resolutions” means, with respect to any Person, those resolutions adopted by such Person’s Board of Directors and delivered by such Person to the Collateral Agent pursuant to Section 3.1 approving the Loan Documents to which such Person is a party and the transactions contemplated thereby (including the Term Loans), together with a certificate executed by its Secretary on behalf of such Person certifying that (a) such Person has the authority to execute, deliver, and perform its obligations under each of the Loan Documents to which it is a party, (b) that attached as Exhibit A to such certificate is a true, correct, and complete copy of the resolutions then in full force and effect authorizing and ratifying the execution, delivery, and performance by such Person of the Loan Documents to which it is a party, (c) the name(s) and title(s) of the officers of such Person authorized to execute the Loan Documents to which such Person is a party on behalf of such Person, together with a sample of the true signature(s) of such Person(s), and (d) that the Collateral Agent and each Lender may conclusively rely on such certificate with respect to the authority of such officers unless and until such Person shall have delivered to the Collateral Agent a further certificate canceling or amending such prior certificate.

“Business Day” means any day that is not a Saturday or a Sunday or a day on which banks are authorized or required to be closed in New York, New York, London or the Cayman Islands.

“Capital Lease” means, as applied to any Person, any lease of any property by that Person as lessee which, in accordance with Applicable Accounting Standards, is required to be accounted for as a capital lease on the balance sheet of that Person.

“Cash Equivalents” means

(a) securities issued or directly and fully guaranteed or insured by the United States government or any agency or instrumentality of the United States government or by the government of any other member country of O.E.C.D. (provided that the full faith and credit of the United States or such other member country of O.E.C.D., as applicable, is pledged in support of those securities), in each case, having maturities of not more than two (2) years from the date of acquisition;

(b) certificates of deposit, time deposits with maturities of one year or less from the date of acquisition, bankers’ acceptances with maturities not exceeding one year and overnight bank deposits and demand deposits, in each case, with any commercial bank having (i) capital and surplus in excess of \$500,000,000 in the case of U.S. banks or (ii) capital and surplus in excess of \$100,000,000 (or the U.S. dollar equivalent as of the date of determination) in the case of non-U.S. banks;

(c) commercial paper or marketable short-term money market or readily marketable direct obligations and similar securities having one of the two highest ratings obtainable from Moody’s Investors Services, Inc. or S&P Global Ratings and, in each case, maturing within two (2) years after the date of acquisition;

(d) repurchase obligations with a term of not more than seven (7) days for underlying securities of the types described in clauses (a) and (c) above entered into with any financial institution meeting the qualifications specified in clause (b) above;

(e) investment funds investing ninety-five percent (95.0%) of their assets in securities of the types described in clauses (a) through (d) above and clause (f) below;

(f) investments in money market funds rated “AAA” (or the equivalent thereof) or better by S&P Global Ratings or “Aaa” (or the equivalent thereof) or better by Moody’s Investors Services, Inc. (or, if at any time neither Moody’s Investors Services, Inc. nor S&P Global Ratings shall be rating such obligations, an equivalent rating from another rating agency) and that have portfolio assets of at least \$1,000,000,000; and

(g) other investments in accordance with the Borrower’s investment policy as of the Tranche A Closing Date or otherwise approved in writing by Collateral Agent.

“CFC” means a “controlled foreign corporation” under Section 957 of the IRC.

“CFC Holdco” means, with respect to any Credit Party, a Subsidiary of such Credit Party that is (i) organized, incorporated, or formed under the laws of the United States or any state thereof and (ii) has no material assets other than Equity Interests (or Equity Interests and Indebtedness) in one or more Foreign Subsidiaries that are CFCs or CFC Holdcos.

“Change in Control” means: (a) a transaction or series of transactions (including any merger or consolidation with Borrower) in which any “person” or “group” (within the meaning of Section 13(d) and 14(d)(2) of the Exchange Act, but excluding any employee benefit plan of such Person or its Subsidiaries, and any Person acting in its capacity as trustee, agent or other fiduciary or administrator of any such plan) is or becomes the “beneficial owner” (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of [**]; (b) a sale of all or substantially all of the consolidated assets of Borrower and its Subsidiaries in one transaction or a series of transactions (whether by way of merger, stock purchase, asset purchase or otherwise); or (c) a merger or consolidation involving Borrower [**].

“Change in Law” means the occurrence, after the date of this Agreement, of any of the following: (a) the adoption or taking into effect of any law, treaty, order, policy, rule or regulation, (b) any change in any law, treaty, order, policy, rule or regulation or in the administration, interpretation or application thereof by any Governmental Authority or (c) the making or issuance of any request, guideline or directive (whether or not having the force of law) by any Governmental Authority; provided that notwithstanding anything herein to the contrary, (x) the Dodd-Frank Wall Street Reform and Consumer Protection Act and all requests, rules, guidelines or directives thereunder or issued in connection therewith and (y) all requests, rules, guidelines or directives promulgated by the Bank for International Settlements, the Basel Committee on Banking Supervision (or any successor or similar authority) or the United States or foreign regulatory authorities, in each case pursuant to Basel III, shall be deemed to be a “Change in Law”, regardless of the date enacted, adopted or issued.

“Closing Date” means the Tranche A Closing Date or the Tranche B Closing Date, as applicable.

“Code” means the Uniform Commercial Code, as the same may, from time to time, be enacted and in effect in the State of New York; provided, that, to the extent that the Code is used to define any term herein or in any Loan Document and such term is defined differently in different Articles of the Code, the definition of such term contained in Article 9 of the Code shall govern; provided, further, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection, or priority of, or remedies with respect to, the Collateral Agent’s Lien in favor and for the benefit of Lenders and the other Secured Parties on any Collateral is governed by the Uniform Commercial Code in effect in a jurisdiction other than the State of New York, the term “Code” shall mean the Uniform Commercial Code as enacted and in effect in such other jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority, or remedies and for purposes of definitions relating to such provisions.

“Collateral” means, collectively, “Collateral” (as such term is defined in the Security Agreement) and all other property of whatever kind and nature subject or purported to be subject from time to time to a Lien under any Collateral Document, but in any event excluding all Excluded Property.

“Collateral Account” means any Deposit Account of a Credit Party maintained with a bank or other depository or financial institution located in the United States, any Securities Account of a Credit Party maintained with a securities intermediary located in the United States, or any Commodity Account of a Credit Party maintained with a commodity intermediary located in the United States, in each case, other than an Excluded Account.

“Collateral Documents” means the Security Agreement, the Control Agreements, the IP Agreements, any Mortgages and all other instruments, documents and agreements delivered by any Credit Party pursuant to this Agreement or any of the other Loan Documents, in each case, in order to grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties or perfect a Lien on any Collateral as security for the Obligations, and all amendments, restatements, modifications or supplements thereof or thereto.

“Commodity Account” means any “commodity account” as defined in the Code with such additions to such term as may hereafter be made.

“Company IP” means any and all of the following, as they exist in and throughout the Territory: (a) Current Company IP; (b) improvements, continuations, continuations-in-part, divisions, provisionals or any substitute applications, any patent issued with respect to any of the Current Company IP, any patent right claiming the composition of matter of, or the method of making or using, the Product in the Territory, any reissue, reexamination, renewal or patent term extension or adjustment (including any supplementary protection certificate) of any such patent, and any confirmation patent or registration patent or patent of addition based on any such patent; (c) trade secrets or trade secret rights, including any rights to unpatented inventions, know-how, show-how, operating manuals, confidential or proprietary information, research in progress, algorithms, data, databases, data collections, designs, processes, procedures, methods, protocols, materials, formulae, drawings, schematics, blueprints, flow charts, models, strategies, prototypes, techniques, and the results of experimentation and testing, including samples, in each case, as specifically related to any research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory; (d) any and all IP Ancillary Rights specifically relating to any of the foregoing; and (e) regulatory filings, submissions and approvals related to any research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory and all data provided in any of the foregoing.

“**[**]**” means, at any time of determination, any Person that is [**].

“**Compliance Certificate**” means that certain certificate in the form attached hereto as Exhibit D.

“**Connection Income Taxes**” means Other Connection Taxes that are imposed on or measured by net income (however denominated) or that are franchise Taxes or branch profits Taxes.

“**[**]**” means, as of any date of determination, (a) Borrower’s and its Subsidiaries’ share of [**] in each case, determined on a [**] delivered to Collateral Agent on or prior to the Effective Date.

“**Contingent Obligation**” means, for any Person, any direct or indirect liability, contingent or not, of that Person for (a) any indebtedness, lease, dividend, letter of credit or other obligation of another Person directly or indirectly guaranteed, endorsed, co-made, discounted or sold with recourse by that Person, or for which that Person is directly or indirectly liable; (b) any obligation for undrawn letters of credit for the account of that Person; or (c) any obligation of that Person to pay an earn-out, milestone payment or similar contingent or deferred consideration to a counterparty incurred or created in connection with an Acquisition, Transfer, Investment or other sale or disposition, including, with respect to any purchase price holdback in respect of a portion of the purchase price of an asset sold to that Person to satisfy unperformed obligations of the seller of such asset, any obligation to pay such seller the excess of such holdback over such obligations. The amount of a Contingent Obligation is the stated or determined amount of the primary obligation for which the Contingent Obligation is made or, if not determinable, the maximum reasonably anticipated liability for it reasonably determined by such Person in good faith; but the amount may not exceed the maximum of the obligations under any guarantee or other support arrangement. Notwithstanding anything to the contrary in the foregoing, any Permitted Bond Hedge Transaction and any Permitted Warrant Transaction, in each case, shall not constitute Contingent Obligations of the Borrower.

“**Control Agreement**” means, with respect to any Credit Party, any control agreement entered into among such Credit Party, the Collateral Agent and, in the case of a Deposit Account, the bank or other depository or financial institution located in the United States at which such Credit Party maintains such Deposit Account, or, in the case of a Securities Account or a Commodity Account, the securities intermediary or commodity intermediary located in the United States at which such Credit Party maintain such Securities Account or Commodities Account, in either case, pursuant to which the Collateral Agent obtains control (within the meaning of the Code) over such Collateral Account.

“**Controlled Investment Affiliate**” means, with respect to any Lender, any fund, investment vehicle or other Person (other than a natural person) that (a) that is (or will be) engaged in making, purchasing, holding or otherwise investing in commercial loans and similar extensions of credit in the ordinary course of its activities and (b) controls, is controlled by, or under common control with, such Lender. For purposes of this definition “control” means (i) direct or indirect beneficial ownership of more than fifty percent (50%) (or such lesser percentage which is the maximum allowed to be owned by a foreign corporation in a particular jurisdiction) of the voting share capital or other equity interest in a Person or (b) the power to direct or cause the direction of the management of such Person by contract or otherwise.

“**Copyrights**” means any and all copyright rights, copyright applications, copyright registrations and like protections in each work of authorship and derivative work thereof, whether published or unpublished and whether or not the same also constitutes a trade secret (and all related IP Ancillary Rights).

“**Credit Extension**” means any Term Loan or any other extension of credit by any Lender for Borrower’s benefit pursuant to this Agreement.

“**Credit Party**” means Borrower and each Guarantor.

“**Current Company IP**” is defined in Section 4.6(c).

“**Current Company IP Agreement**” means each of the: [**].

“Data Protection Laws” means any and all foreign or domestic, statutes, ordinances, orders, rules, regulations, judgments, Governmental Approvals, or any other requirements of Governmental Authorities relating to the privacy, security, or confidentiality of personal data (including individually identifiable information) and other sensitive information, including HIPAA and Section 5 of the Federal Trade Commission Act (15 U.S.C. § 45).

“Default” means any breach of or default under any term, provision, condition, covenant or agreement contained in this Agreement or any other Loan Document or any other event, in each case that, with the giving of notice or the lapse of time or both, would constitute an Event of Default.

“Delayed Amortization Notice” is defined in [Section 2.2\(b\)\(ii\)](#).

“Deposit Account” means any “deposit account” as defined in the Code with such additions to such term as may hereafter be made.

“Disclosure Letter” means the disclosure letter, dated the Effective Date, delivered by the Credit Parties to the Collateral Agent, as updated on the Closing Date (if required and as permitted).

“Dollars,” “dollars” or use of the sign “\$” means only lawful money of the United States and not any other currency, regardless of whether that currency uses the “\$” sign to denote its currency or may be readily converted into lawful money of the United States.

“Effective Date” is defined in the preamble hereof.

“Environmental Claim” means any investigation, notice, notice of violation, claim, action, suit, proceeding, demand, abatement order or other order or directive (conditional or otherwise), by any Governmental Authority or any other Person, arising (i) pursuant to or in connection with any actual or alleged violation of any Environmental Law; (ii) in connection with any Hazardous Material or any actual or alleged Hazardous Materials Activity; or (iii) in connection with any actual or alleged damage, injury, threat or harm to health, safety, natural resources or the environment.

“Environmental Laws” means any and all current or future, foreign or domestic, statutes, ordinances, orders, rules, regulations, judgments, Governmental Approvals, or any other requirements of Governmental Authorities relating to (i) environmental matters, including those relating to any Hazardous Materials Activity; (ii) the generation, use, storage, transportation or disposal of Hazardous Materials; or (iii) occupational safety and health, industrial hygiene, land use or the protection of human, plant or animal health or welfare, in each case, in any manner applicable to any Credit Party or any of its Subsidiaries or any Facility.

“Equity Interests” means, with respect to any Person, any and all shares, interests, participations or other equivalents (however designated) of capital stock of a corporation, any and all equivalent ownership interests in such Person (other than a corporation), including partnership interests and membership interests, and any and all warrants, rights or options to purchase or other arrangements or rights to acquire (by purchase, conversion, dividend, distribution or otherwise) any of the foregoing (and all other rights, powers, privileges, interests, claims and other property in any manner arising therefrom or relating thereto).

“ERISA” means the Employee Retirement Income Security Act of 1974, and its regulations.

“ERISA Affiliate” means, with respect to any Person, any trade or business (whether or not incorporated) that, together with such Person, is treated as a single employer under Section 414(b) or (c) of the IRC or, solely for purposes of Section 302 of ERISA or Section 412 of the IRC, Section 412(m) or (o) of the IRC.

“ERISA Event” means (a) any “reportable event,” as defined in Section 4043 of ERISA or the regulations issued thereunder, with respect to a Plan (other than an event for which the 30-day notice period is waived by regulation); (b) with respect to a Plan, the failure by Borrower or its Subsidiaries or their ERISA Affiliates to satisfy the minimum funding standard of Section 412 of the IRC and Section 302 of ERISA, whether or not waived; (c) the failure by Borrower or its Subsidiaries or their ERISA Affiliates to make by its due date a required installment under Section 430(j) of the IRC with respect to any Plan or to make any required contribution to a Multiemployer Plan; (d) the filing pursuant to Section 412(c) of the IRC or Section 302(c) of ERISA of an application for a waiver of the

minimum funding standard with respect to any Plan; (e) the incurrence by Borrower or any of its ERISA Affiliates of any liability under Title IV of ERISA with respect to the termination of any Plan; (f) the receipt by Borrower or its Subsidiaries or any of their respective ERISA Affiliates from the Pension Benefit Guaranty Corporation (referred to and defined in ERISA) or a plan administrator of any notice relating to the intention to terminate any Plan or Plans under Section 4041 or 4041A of ERISA or to appoint a trustee to administer any Plan under Section 4042 of ERISA, or the occurrence of any event or condition which would reasonably be expected to constitute grounds under ERISA for the termination of, or the appointment of a trustee to administer, any Plan under Section 4041 Section 4042 of ERISA; (g) the incurrence by Borrower or its Subsidiaries or any of their respective ERISA Affiliates of any liability with respect to the withdrawal from any Plan or Multiemployer Plan; (h) the receipt by Borrower or its Subsidiaries or any of their respective ERISA Affiliates of any notice, concerning the imposition of Withdrawal Liability or a determination that a Multiemployer Plan is, or is expected to be, insolvent or in reorganization, within the meaning of Section 4245 or Section 4241, respectively, of ERISA; (i) the “substantial cessation of operations” by Borrower or its Subsidiaries or their ERISA Affiliates within the meaning of Section 4062(e) of ERISA with respect to a Plan; or (j) the occurrence of a nonexempt prohibited transaction (within the meaning of Section 4975 of the IRC or Section 406 of ERISA) which would reasonably be expected to result in material liability to Borrower or its Subsidiaries.

“**Event of Default**” is defined in [Section 7](#).

“**Exchange Act**” means the Securities Exchange Act of 1934.

“**Exchange Act Documents**” is defined in [Section 4.8\(a\)](#).

“**Excluded Accounts**” is defined in [Section 5.5](#).

“**Excluded Equity Interests**” means, collectively: (i) any Equity Interests of any Subsidiary with respect to which the grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of a security interest in and Lien upon, and the pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of, such Equity Interests, to secure the Obligations (and any guaranty thereof) are validly prohibited by Requirements of Law; (ii) any Equity Interests of any Subsidiary with respect to which the grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of a security interest in and Lien upon, and the pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of, such Equity Interests, to secure the Obligations (and any guaranty thereof) require the consent, approval or waiver of any Governmental Authority or other third party and such consent, approval or waiver has not been obtained by Borrower following Borrower’s commercially reasonable efforts to obtain the same; (iii) any Equity Interests of any Subsidiary that is a non-Wholly-Owned Subsidiary that the grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of a security interest in and Lien upon, and the pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of, such Equity Interests, to secure the Obligations (and any guaranty thereof) are validly prohibited by, or would give any third party (other than Borrower or an Affiliate of Borrower) the right to terminate its obligations under, the Operating Documents or the joint venture agreement or shareholder agreement with respect to, or any other contract with such third party relating to such non-Wholly-Owned Subsidiary, including any contract evidencing Indebtedness of such non-Wholly-Owned Subsidiary (other than customary non-assignment provisions which are ineffective under Article 9 of the Code or other Requirements of Law), but only, in each case, to the extent, and for so long as such Operating Document, joint venture agreement, shareholder agreement or other contract is in effect; (iv) any Equity Interests of any Subsidiary organized or acquired and used exclusively to consummate (x) the disposal, transfer, monetization, lease or license of, (y) the granting of a Permitted Lien on or (z) the securing or financing of, in each case any program or transaction solely with respect to, any of the Other Assets; (v) any Equity Interests of any other Subsidiary with respect to which, Borrower and the Collateral Agent reasonably determine by mutual agreement that the cost of granting the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties a security interest, in and Lien upon, and pledging to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties, such Equity Interests, to secure the Obligations (and any guaranty thereof) are excessive, relative to the value to be afforded to the Secured Parties thereby; (vi) any voting Equity Interests in excess of sixty-five percent (65.0%) of the outstanding voting Equity Interests of (A) any Foreign Subsidiary that is a CFC or (B) any CFC Holdco; and (vii) any Equity Interests on any direct or indirect Subsidiary of a Foreign Subsidiary that is a CFC or a CFC Holdco.

“**Excluded Property**” has the meaning set forth in the Security Agreement.

“**Excluded Subsidiaries**” means, collectively: (i) any Subsidiary with respect to which the grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of a security interest in and Lien upon, and the pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of, such Subsidiary’s properties and assets subject or purported to be subject from time to time to a Lien under any Collateral Document and the Equity Interests of such Subsidiary to secure the Obligations (and any guaranty thereof) are validly prohibited by Requirements of Law; (ii) any Subsidiary with respect to which the grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of a security interest in and Lien upon, and the pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of, such Subsidiary’s properties and assets subject or purported to be subject from time to time to a Lien under any Collateral Document and the Equity Interests of such Subsidiary to secure the Obligations (and any guaranty thereof) require the consent, approval or waiver of any Governmental Authority or other third party (other than Borrower or an Affiliate of Borrower) and such consent, approval or waiver has not been obtained by Borrower or such Subsidiary following Borrower’s and such Subsidiary’s commercially reasonable efforts to obtain the same; (iii) any Subsidiary that is a non-Wholly-Owned Subsidiary, with respect to which, the grant to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of a security interest in and Lien upon, and the pledge to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties of, the properties and assets of such non-Wholly-Owned Subsidiary, to secure the Obligations (and any guaranty thereof) are validly prohibited by, or would give any third party (other than Borrower or an Affiliate of Borrower) the right to terminate its obligations under, such non-Wholly-Owned Subsidiary’s Operating Documents or the joint venture agreement or shareholder agreement with respect thereto or any other contract with such third party relating to such non-Wholly-Owned Subsidiary, including any contract evidencing Indebtedness of such non-Wholly-Owned Subsidiary (other than customary non-assignment provisions which are ineffective under Article 9 of the Code or other Requirements of Law), but only, in each case, to the extent, and for so long as such Operating Document, joint venture agreement, shareholder agreement or other contract is in effect; (iv) any Subsidiary that owns properties and assets with an aggregate fair market value (reasonably determined in good faith by a Responsible Officer of Borrower) of less than \$5,000,000; (v) any Foreign Subsidiary that is a CFC; (vi) any (A) CFC Holdco or (B) direct or indirect Subsidiary of a Foreign Subsidiary that is a CFC or a CFC Holdco; (vii) [**]; (viii) Akebia Therapeutics Securities Corporation; and (ix) any other Subsidiary with respect to which, Borrower and the Collateral Agent reasonably determine by mutual agreement that the cost of granting the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties a security interest in and Lien upon, and pledging to the Collateral Agent in favor and for the benefit of Lenders and the other Secured Parties, such Subsidiary’s properties and assets subject or purported to be subject from time to time to a Lien under any Collateral Document and the Equity Interests of such Subsidiary to secure the Obligations (and any guaranty thereof) are excessive relative to the value to be afforded to the Secured Parties thereby.

“**Excluded Taxes**” means any of the following Taxes imposed on or with respect to Lender or required to be withheld or deducted from a payment to Lender, (a) Taxes imposed on or measured by net income (however denominated), franchise Taxes, and branch profits Taxes, in each case, (i) imposed by the United States or as a result of Lender being organized under the laws of, or having its principal office or its applicable lending office located in, the jurisdiction imposing such Tax (or any political subdivision thereof) or (ii) that are Other Connection Taxes, (b) U.S. federal withholding Taxes imposed on amounts payable to or for the account of Lender with respect to any Obligation pursuant to a law in effect on the date on which (i) Lender acquires such interest in any Obligation or (ii) Lender changes its lending office, except in each case to the extent that, pursuant to Section 2.6, amounts with respect to such Taxes were payable either to Lender’s assignor immediately before Lender became a party hereto or to Lender immediately before it changed its lending office, (c) Taxes attributable to Lender’s failure to comply with Section 2.6(d), and (d) any withholding Taxes imposed under FATCA.

“**Facility**” means, with respect to any Credit Party, any real property (including all buildings, fixtures or other improvements located thereon) now, hereafter or heretofore owned, leased, operated or used by such Credit Party or any of its Subsidiaries or any of their respective predecessors or Affiliates, in each case, solely with respect to the manufacture, production, storage or distribution of the Product in the Territory.

“**FATCA**” means Sections 1471 through 1474 of the IRC, as of the date of this Agreement (including, for the avoidance of doubt, any agreements between the governments of the United States and the jurisdiction in which the applicable Lender is resident implementing such provisions), or any amended or successor version that is substantively comparable and not materially more onerous to comply with, and any current or future regulations promulgated thereunder or official interpretations thereof, any agreements entered into pursuant to Section 1471(b)(1) of the IRC, any intergovernmental agreement entered into in connection with the implementation of the foregoing sections of the IRC and any fiscal or regulatory legislation, regulations, rules or practices adopted pursuant to, or official interpretations implementing such Sections of the IRC or intergovernmental agreements.

“**FCPA**” is defined in [Section 4.18\(a\)](#).

“**FDA**” means the United States Food and Drug Administration.

“**FDA Good Manufacturing Practices**” means the standards set forth in 21 C.F.R. Parts 210, 211 and 600 and FDA’s implementing guidance documents.

“**FDA Laws**” means all applicable statutes (including the FDCA), rules and regulations implemented, administered or enforced by the FDA.

“**FDCA**” is defined in [Section 4.19\(b\)](#).

“**Federal Reserve Board**” means the Board of Governors of the Federal Reserve System.

“**Foreign Lender**” means a Lender that is not a “United States person” as defined in Section 7701(a)(30) of the IRC.

“**Foreign Subsidiary**” means a Subsidiary that is not organized under the laws of the United States.

“**[**]**” is defined in [Section 5.7\(c\)](#).

“**Governmental Approval**” means any consent, authorization, approval, order, license, franchise, permit, certificate, accreditation, registration, filing or notice, of, issued by, from or to, or other act by or in respect of, any Governmental Authority.

“**Governmental Authority**” means any nation or government, any state or other political subdivision thereof, any agency (including Regulatory Agencies), government department, authority, instrumentality, regulatory body, court, central bank or other entity exercising executive, legislative, judicial, taxing, regulatory or administrative functions of or pertaining to government, any securities exchange and any self-regulatory organization.

“**Governmental Payor Programs**” means all governmental third party payor programs in which any Credit Party or its Subsidiaries participates, including Medicare, Medicaid, TRICARE or any other federal or state health care programs.

“**Guarantor**” means any Subsidiary that is a present or future guarantor of the Obligations.

“**Hazardous Materials**” means any chemical, material or substance, exposure to which is prohibited, limited or regulated by any Governmental Authority or which may or could pose a hazard to the health and safety of the owners, occupants or any Persons in the vicinity of any Facility or to the indoor or outdoor environment.

“**Hazardous Materials Activity**” means any past, current, proposed or threatened activity, event or occurrence involving any Hazardous Materials, including the use, manufacture, possession, storage, holding, presence, existence, location, Release, threatened Release, discharge, placement, generation, transportation, processing, construction, treatment, abatement, removal, remediation, disposal, disposition or handling of any Hazardous Materials, and any corrective action or response action with respect to any of the foregoing.

“Health Care Laws” means, collectively: (a) applicable federal, state or local laws, rules, regulations, orders, ordinances, statutes and requirements issued under or in connection with Medicare, Medicaid or any other Government Payor Program; (b) applicable federal and state laws and regulations governing the confidentiality of health information, including HIPAA; (c) applicable federal, state and local fraud and abuse laws of any Governmental Authority, including the federal Anti-Kickback Statute (42 U.S.C. § 1320a-7(b)), the civil False Claims Act (31 U.S.C. § 3729 et seq.), Sections 1320a-7 and 1320a-7a of Title 42 of the United States Code and the regulations promulgated pursuant to such statutes; (d) the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (Pub. L. No. 108-173) and the regulations promulgated thereunder; (e) the Physician Payment Sunshine Act (42 U.S.C. § 1320a-7h); (f) all applicable reporting and disclosure requirements under the Medicaid Drug Rebate Program (e.g., Monthly and Quarterly Average Manufacturer Price, Baseline Average Manufacturer Price, and Rebate Per Unit, as applicable), Medicare Part B (Quarterly Average Sales Price), Section 602 of the Veteran’s Health Care Act (Public Health Service 340B Quarterly Ceiling Price), Section 603 of the Veteran’s Health Care Act (Quarterly and Annual Non-Federal Average Manufacturer Price and Federal Ceiling Price), Best Price, Federal Supply Schedule Contract Prices and Tricare Retail Pharmacy Refunds, and Medicare Part D; (g) applicable health care laws, rules, codes, statutes, regulations, orders, ordinances and requirements pertaining to Medicare or Medicaid; in each case, in any manner applicable to any Credit Party or any of its Subsidiaries; and (h) any other applicable health care laws, rules, codes, regulations, manuals, orders, ordinances, and statutes relating to the manufacture, sale and distribution of pharmaceutical products.

“Hedging Agreement” means any interest rate, currency, commodity or equity swap, collar, cap, floor or forward rate agreement, or other agreement or arrangement designed to protect a Person against fluctuations in interest rates, currency exchange rates or commodity or equity prices or values (including any option with respect to any of the foregoing and any combination of the foregoing agreements or arrangements), and any confirmation execution in connection with any such agreement or arrangement. Notwithstanding anything to the contrary in the foregoing, any Permitted Bond Hedge Transaction and any Permitted Warrant Transaction, in each case, shall not constitute Hedging Agreements of the Borrower.

“HIPAA” means the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act (HITECH) of 2009, any and all rules or regulations promulgated from time to time thereunder, and any state or federal laws with regards to the security, privacy, or notification of breaches of the confidentiality of health information which are not preempted pursuant to 45 C.F.R. Part 160, Subpart B.

“Indebtedness” means, with respect to any Person, without duplication: (a) all indebtedness for advanced or borrowed money of, or credit extended to, such Person; (b) all obligations issued, undertaken or assumed by such Person as the deferred purchase price of assets, properties, services or rights (other than (i) accrued expenses and trade payables entered into in the ordinary course of business consistent with past practice which are not more than [**] past due or subject to a bona fide dispute, (ii) obligations to pay for services provided by employees and individual independent contractors in the ordinary course of business consistent with past practice which are not more than [**] past due or subject to a bona fide dispute, (iii) liabilities associated with customer prepayments and deposits and (iv) prepaid or deferred revenue arising in the ordinary course of business consistent with past practice), including any obligation or liability to pay deferred or contingent purchase price or other consideration for such assets, properties, services or rights; (c) the face amount of all letters of credit issued for the account of such Person and, without duplication, all drafts drawn thereunder and all reimbursement or payment obligations with respect to letters of credit, surety bonds, performance bonds and other similar instruments issued by such Person; (d) all obligations of such Person evidenced by notes, bonds, debentures or other debt securities or similar instruments (including debt securities convertible into Equity Interests), including obligations so evidenced incurred in connection with the acquisition of properties, assets or businesses; (e) all indebtedness of such Person created or arising under any conditional sale or other title retention agreement or incurred as financing, in either case with respect to property acquired by such Person (even though the rights and remedies of the seller or bank under such agreement in the event of default are limited to repossession or sale of such property); (f) all capital lease obligations of such Person; (g) the principal balance outstanding under any synthetic lease, off-balance sheet loan or similar off balance sheet financing product by such Person; (h) all obligations of such Person, whether or not contingent, to purchase, redeem, retire, defease or otherwise acquire for value any of its own Equity Interests (or any Equity Interests of a direct or indirect parent entity thereof) prior to the date that is [**] after the Term Loan Maturity Date, valued at, in the case of redeemable preferred Equity Interests, the greater of the voluntary liquidation preference and the involuntary liquidation preference of such Equity Interests plus accrued and unpaid dividends; (i) all indebtedness referred to in clauses (a) through (h) above of other

Persons secured by (or for which the holder of such indebtedness has an existing right, contingent or otherwise, to be secured by) any Lien upon or in assets or properties (including accounts and contracts rights) owned by such Person, even though such Person has not assumed or become liable for the payment of such indebtedness of such other Persons; and (j) all Contingent Obligations of such Person. Notwithstanding anything to the contrary in the foregoing, any Permitted Bond Hedge Transaction and any Permitted Warrant Transaction, in each case, shall not constitute Indebtedness of the Borrower.

“Indemnified Liabilities” means, collectively, any and all liabilities, obligations, losses, damages (including natural resource damages), penalties, claims, actions, judgments, suits, costs, reasonable and documented out-of-pocket expenses and disbursements of any kind or nature whatsoever (including the reasonable and documented fees and disbursements of one counsel for Indemnified Persons plus, if required, one local legal counsel in each relevant material jurisdiction, and in the case of an actual or perceived conflict of interest, one additional counsel for such affected Indemnified Persons, in connection with any investigative, administrative or judicial proceeding or hearing commenced or threatened in writing by any Person, whether or not any such Indemnified Person shall have commenced such proceeding or hearing or be designated as a party or a potential party thereto, and any fees or expenses incurred by Indemnified Persons in enforcing the indemnity hereunder), whether direct, indirect or consequential and whether based on any federal, state or foreign laws, statutes, rules or regulations, on common law or equitable cause or on contract or otherwise, that may be imposed on, incurred by, or asserted against any such Indemnified Person, in any manner relating to or arising out of this Agreement or the other Loan Documents or the transactions contemplated hereby or thereby (including any Lender’s agreement to make Credit Extensions or the use or intended use of the proceeds thereof, or any enforcement of any of the Loan Documents (including any sale of, collection from, or other realization upon any of the Collateral or the enforcement of any guaranty of the Obligations)).

“Indemnified Person” is defined in [Section 11.2\(a\)](#).

“Indemnified Taxes” means (a) Taxes, other than Excluded Taxes, imposed on or with respect to any payment made by or on account of any obligation of any Credit Party under any Loan Document and (b) to the extent not otherwise described in [clause \(a\)](#) above, Other Taxes.

“Insolvency Proceeding” means, with respect to any Person, any proceeding by or against such Person under the United States Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments for the benefit of creditors, compositions, extensions generally with its creditors, or proceedings seeking reorganization, arrangement, or other relief.

“Intellectual Property” means all:

- (a) Copyrights, Trademarks, and Patents;
- (b) trade secrets and trade secret rights, including any rights to unpatented inventions, know-how, show-how and operating manuals;
- (c) (i) all computer programs, including source code and object code versions, (ii) all data, databases and compilations of data, whether machine readable or otherwise, and (iii) all documentation, training materials and configurations related to any of the foregoing (collectively, **“Software”**);
- (d) all right, title and interest arising under any contract or Requirements of Law in or relating to Internet domain names;
- (e) design rights;
- (f) IP Ancillary Rights (including all IP Ancillary Rights related to any of the foregoing); and
- (g) any similar or equivalent rights to any of the foregoing anywhere in the world.

“Interest Date” means the last day of each calendar quarter.

“**Interest Period**” means, with respect to the Term Loans, (a) the period commencing on (and including) the applicable borrowing date of the Term Loans and ending on (and including) the first Interest Date following such Borrowing, provided, that if such Interest Date is not a Business Day, the applicable Interest Period shall end on the first Business Day immediately following such Interest Date, and (b) thereafter, each period beginning on (and including) the first day following the end of the preceding Interest Period and ending on the earlier of (and including) (x) the next Interest Date, provided, that if any such last day is not a Business Day, the applicable Interest Period shall end on the first Business Day immediately preceding such Interest Date, (y) the next Payment Date, provided, that if any such day is not a Business Day, the applicable Interest Period shall end on the first Business Day immediately following such Payment Date and (z) the Term Loan Maturity Date. For the avoidance of doubt, if an Interest Period ends on a Payment Date, the next Interest Period shall commence on (and include) the first day following such Payment Date and shall end on (and include) the earlier of the next Interest Date, the next Payment Date or the Term Loan Maturity Date, as described above.

“**Interest Rate Determination Date**” means (a) initially, the Closing Date and (b) thereafter, the first day of each Interest Period (or, if any such day is not a Business Day, the first Business Day immediately following such day).

“**Internet Domain Name**” means all right, title and interest (and all related IP Ancillary Rights) arising under any contract or Requirements of Law in or relating to Internet domain names.

“**Inventory**” means all “inventory” as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made, and includes all merchandise, raw materials, parts, supplies, packing and shipping materials, work in process and finished products, including such inventory as is temporarily out of a Credit Party’s or Subsidiary’s custody or possession or in transit and including any returned goods and any documents of title representing any of the above.

“**Investment**” means (a) any beneficial ownership interest in any Person (including Equity Interests), (b) any Acquisition or (c) the making of any advance, loan, extension of credit or capital contribution in or to, any Person.

“**IP Agreements**” means, collectively, (a) those certain Intellectual Property Security Agreements entered into by and between Borrower and the Collateral Agent, each dated as of the Closing Date, and (b) any Intellectual Property Security Agreement entered into by and between Borrower and the Collateral Agent after the Closing Date in accordance with the Loan Documents.

“**IP Ancillary Rights**” means, with respect to any Copyright, Trademark, Patent, Software, trade secrets or trade secret rights, including any rights to unpatented inventions, know-how, show-how and operating manuals, all income, royalties, proceeds and liabilities at any time due or payable or asserted under or with respect to any of the foregoing or otherwise with respect thereto, including all rights to sue or recover at law or in equity for any past, present or future infringement, misappropriation, dilution, violation or other impairment thereof, and, in each case, all rights to obtain any other intellectual property right ancillary to any Copyright, Trademark, Patent, Software, trade secrets or trade secret rights.

“**IRC**” means the Internal Revenue Code of 1986, as amended.

“**IRS**” is defined in Section 2.6(d)(i).

“**Knowledge**” of Borrower means the actual knowledge, after reasonable investigation, of the Responsible Officers of Borrower or such other Credit Party, as the context dictates.

“**Lender**” means each Person signatory hereto as a “Lender” and its successors and assigns.

“**Lender Expenses**” means (i) all reasonable and documented out-of-pocket fees and expenses of the Collateral Agent and each Lender and their respective Related Parties for developing, preparing, amending, modifying, negotiating, syndicating, executing and delivering, and interpreting and administering the Loan Documents or any other document prepared in connection therewith or the consummation and administration of any transaction contemplated therein or any modification of any term or provision of or the termination of, any Loan Document or otherwise incurred with respect to the Credit Parties in connection with the Loan Documents, including any filing or

recording fees and expenses [**] and (ii) all reasonable and documented out-of-pocket costs and expenses incurred by the Collateral Agent and each Lender and their respective Related Parties (including the reasonable and documented out-of-pocket fees and expenses of legal counsel therefor), in connection with (A) any refinancing or restructuring of the credit arrangements provided hereunder in the nature of a “work-out”, (B) the enforcement or preservation of any right or remedy under any Loan Document, any Obligation, with respect to the Collateral or any other related right or remedy or (C) the commencement, defense, conduct of, intervention in, or the taking of any other action with respect to, any proceeding (including any Insolvency Proceeding) related to any Credit Party, any Subsidiary of any Credit Party, Loan Document or Obligation (or the response to and preparation for any subpoena or request for document production relating thereto).

“**Lender Transfer**” is defined in [Section 11.1\(b\)](#).

“**LIBOR Rate**” means, as of any Interest Rate Determination Date and for any Interest Period, the rate per annum equal to [**] for a period of three (3) months; provided, however, that, for purposes of calculating the Term Loan Rate, the LIBOR Rate shall at all times have a floor of 2.00%; provided, further, that, for purposes of calculating the Term Loan Rate, the LIBOR Rate shall at all times be subject to a cap of 3.35%.

“**Lien**” means a claim, mortgage, deed of trust, levy, charge, pledge, security interest or other encumbrance of any kind or assignment for security purposes, whether voluntarily incurred or arising by operation of law or otherwise against any property or assets.

“[**]” shall have the meaning given in [Section 5.7\(c\)](#).

“**Loan Documents**” means, collectively, this Agreement, the Disclosure Letter, the Term Loan Notes, the Security Agreement, the IP Agreements, the Perfection Certificates, any Control Agreement, any other Collateral Document, any guaranties executed by a Guarantor in favor of the Collateral Agent for the benefit of Lenders and the other Secured Parties in connection with this Agreement, and any other present or future agreement between or among a Credit Party, the Collateral Agent and any Lender in connection with this Agreement, including in each case, for the avoidance of doubt, any annexes, exhibits or schedules thereto.

“**Makewhole Amount**” means the Tranche A Makewhole Amount or the Tranche B Makewhole Amount (as applicable) or any combination thereof, as the context dictates.

“**Manufacturing Agreement**” means any manufacturing or supply agreement entered into by any Credit Party or any of its Subsidiaries with third parties for the commercial supply in the Territory of Product for any indication in the United States or for the commercial supply of the active pharmaceutical ingredient incorporated therein.

“**Margin Stock**” means “margin stock” within the meaning of Regulations U and X of the Federal Reserve Board as now and from time to time hereafter in effect.

“**Material Adverse Change**” means any material adverse change in or effect on: (i) the business, financial condition, prospects [**], properties or assets [**], liabilities [**], operations, or performance of the Credit Parties, taken as a whole, [**]; (ii) without limiting the generality of [clause \(i\)](#) above, the rights of the Borrower and its Subsidiaries, taken as a whole, in or related to the [**]; (iii) the ability of the Borrower and its Subsidiaries, taken as a whole, to fulfill the payment or performance obligations under this Agreement or any other Loan Document; or (iv) the binding nature or validity of, or the ability of the Collateral Agent or any Lender to enforce, the Loan Documents or any of its rights or remedies under the Loan Documents.

“**Material Contract**” means any contract or other arrangement to which any Credit Party or any of its Subsidiaries is a party (other than the Loan Documents) or by which any assets or properties constituting Collateral under the Loan Documents are bound, in each case, relating to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory, for which the breach of, default or nonperformance under, cancellation or termination of or the failure to renew could reasonably be expected to result in [**]. For the avoidance of doubt, each [**] is a Material Contract.

“**Medicaid**” means the health care assistance program established by Title XIX of the SSA (42 U.S.C. 1396 et seq.).

“**Medicare**” means the health insurance program for the aged and disabled established by Title XVIII of the SSA (42 U.S.C. 1395 et seq.).

“**Mortgage**” means any deed of trust, leasehold deed of trust, mortgage, leasehold mortgage, deed to secure debt, leasehold deed to secure debt or other document creating a Lien on real estate or any interest in real estate.

“**Multiemployer Plan**” means a multiemployer plan within the meaning of Section 4001(a)(3) or Section 3(37) of ERISA (a) to which Borrower or its Subsidiaries or their respective ERISA Affiliates is then making or accruing an obligation to make contributions; (b) to which Borrower or its Subsidiaries or their respective ERISA Affiliates has within the preceding five (5) plan years made contributions; or (c) with respect to which Borrower or its Subsidiaries would reasonably be expected to incur material liability.

“**Obligations**” means, collectively, the Credit Parties’ obligations to pay when due any and all debts, principal, interest, [**] the Additional Consideration, the Makewhole Amount (if applicable), the Prepayment Premium (if applicable) and any other fees, expenses, indemnities and amounts any Credit Party owes any Lender or the Collateral Agent now or later, under this Agreement or any other Loan Document, including interest accruing after Insolvency Proceedings begin (whether or not allowed), and to perform Borrower’s duties under the Loan Documents. Notwithstanding the foregoing, the Obligations shall not include any warrants or other equity instruments.

“**OFAC**” is defined in Section 4.18(c).

“**OFAC Lists**” means, collectively, the Specially Designated Nationals and Blocked Persons List maintained by OFAC pursuant to Executive Order No. 13224, 66 Fed. Reg. 49079 (Sept. 25, 2001) or any other list of terrorists or other restricted Persons maintained pursuant to any of the rules and regulations of OFAC or pursuant to any other applicable Executive Orders.

“**Operating Documents**” means, collectively with respect to any Person such Person’s formation documents as certified with the Secretary of State or other applicable Governmental Authority of such Person’s jurisdiction of formation on a date that is no earlier than thirty (30) days prior to the date on which such documents are due to be delivered under this Agreement and, (a) if such Person is a corporation, its bylaws (or similar organizational regulations) in current form, (b) if such Person is a limited liability company, its limited liability company agreement (or similar agreement), and (c) if such Person is a partnership, its partnership agreement (or similar agreement), in each case, with all current amendments, restatements, supplements or modifications thereto.

“**Optional Amortization Condition**” means, at any time of determination, [**] has been [**] and [**] at such time are [**].

“**ordinary course of business**” means, in respect of any transaction involving any Person, the ordinary course of such Person’s business, undertaken by such Person in good faith and not for purposes of evading any covenant, prepayment obligation or restriction in any Loan Document.

“**Other Connection Taxes**” means, with respect to any Lender, Taxes imposed as a result of a present or former connection (including present or former connection of its agents) between such Lender and the jurisdiction imposing such Tax (other than connections arising solely from such Lender having executed, delivered, become a party to, performed its obligations under, received payments under, received or perfected a security interest under, engaged in any other transaction pursuant to or enforced any Loan Document, or sold or assigned an interest in any Term Loan or Loan Document).

“**Other Assets**” means, collectively, “Other Assets” (as such term is defined in the Security Agreement).

“**Other Taxes**” means all present or future stamp, court or documentary, intangible, recording, filing, mortgage or property Taxes, charges or similar levies or similar Taxes that arise from any payment made hereunder, from the execution, delivery, performance, enforcement or registration of, from the receipt or perfection of a security interest under, or otherwise with respect to, any Loan Document, except any such Taxes that are Other Connection Taxes imposed with respect to an assignment.

“**Participant Register**” is defined in Section 11.1(d).

“**Patents**” means all patents and patent applications (including any improvements, continuations, continuations-in-part, divisions, provisionals or any substitute applications), any patent issued with respect to any of the foregoing patent applications, any reissue, reexamination, renewal or patent term extension or adjustment (including any supplementary protection certificate) of any such patent, and any confirmation patent or registration patent or patent of addition based on any such patent, and all foreign and international counterparts of any of the foregoing. For the avoidance of doubt, patents and patent applications under this definition include all those filed with the U.S. Patent and Trademark Office.

“**Patriot Act**” is defined in Section 3.1(i).

“**Payment/Advance Form**” means that certain form attached hereto as Exhibit A.

“**Payment Date**” means, with respect to the Tranche A Loan and the Tranche B Loan, as applicable, (a) the Interest Date immediately following each of the date that is (i) the 33rd-month anniversary of the Closing Date, (ii) the 36th-month anniversary of the Closing Date, (iii) the 39th-month anniversary of the Closing Date, (iv) the 42nd-month anniversary of the Closing Date, (v) the 45th-month anniversary of the Closing Date, (vi) the 48th-month anniversary of the Closing Date, (vii) the 51st-month anniversary of the Closing Date, (viii) the 54th-month anniversary of the Closing Date, (ix) the 57th-month anniversary of the Closing Date, and (b) the Term Loan Maturity Date, as the context dictates; provided, however, that in the event Borrower elects to delay amortization pursuant to and subject to the terms of Section 2.2(b)(ii) hereof, “Payment Date” shall mean each of the date that is only in clauses (a)(vi) through (ix) and clause (b) above. Notwithstanding the foregoing, “**Payment Date**” shall be further adjusted in accordance with Section 2.2(b)(iii) hereof.

“**Perfection Certificate**” is defined in Section 4.6.

“**Permitted Acquisition**” means any Acquisition [**], so long as:

(a) no Default or Event of Default shall have occurred and be continuing as of, or could reasonably be expected to result from, the consummation of such Acquisition;

(b) in the case of an Asset Acquisition of properties or assets which do not constitute [**], the subject assets are being acquired [**] by a Credit Party, and such Credit Party shall have executed and delivered or authorized, as applicable, any and all security agreements, financing statements and any other documentation reasonably requested by the Collateral Agent, in order to include the newly acquired [**] assets within the Collateral, as applicable, to the extent required by Section 5.12;

(c) in the case of a Stock Acquisition, the subject Equity Interests are being acquired in such Acquisition directly by a Credit Party, and such Credit Party shall have complied with its obligations under Section 5.13; and

(d) any Indebtedness or Liens assumed in connection with such Acquisition are otherwise permitted under Section 6.4 or 6.5, respectively.

“**Permitted Bond Hedge Transaction**” means any call or capped call option (or substantively equivalent derivative transaction) relating to Borrower’s common stock (or other securities or property following a merger event or other change of the common stock of Borrower) purchased by Borrower in connection with the issuance of any Permitted Convertible Indebtedness; provided that the purchase price for such Permitted Bond Hedge Transaction, less the proceeds received by Borrower from the sale of any related Permitted Warrant Transaction, does not exceed the net proceeds received by Borrower from the issuance of such Permitted Convertible Indebtedness in connection with such Permitted Bond Hedge Transaction or result in the incurrence of additional Indebtedness by Borrower (other than such Permitted Convertible Indebtedness).

“Permitted Convertible Indebtedness” means Indebtedness of Borrower that is convertible into common stock of Borrower (or other securities or property following a merger event or other change of the common stock of Borrower), cash or any combination thereof (with the amount of such cash or such combination determined by reference to the market price of such common stock or such other securities); provided that (i) the terms, conditions and covenants of such Indebtedness shall be [**]; (ii) such Indebtedness has [**], (iii) such Indebtedness is an [**] obligation of Borrower that is [**], (iv) immediately prior to and after giving effect to the incurrence of such Indebtedness, no Default or Event of Default has occurred and is continuing and (v) at the time such Indebtedness is incurred, Borrower shall have delivered to the Collateral Agent and the Lenders a certificate of a Responsible Officer of Borrower certifying as to the foregoing.

“Permitted Distributions” means, in each case subject to Section 6.8 if applicable:

- (a) dividends, distributions or other payments by any Wholly-Owned Subsidiary on its Equity Interests to, or the redemption, retirement or purchase by any Wholly-Owned Subsidiary of its Equity Interests from, Borrower or any other Wholly-Owned Subsidiary;
- (b) dividends, distributions or other payments by any non-Wholly-Owned Subsidiary on its Equity Interests to, or the redemption, retirement or purchase by any non-Wholly-Owned Subsidiary of its Equity Interests from, Borrower or any other Subsidiary or each other owner of such non-Wholly-Owned Subsidiary’s Equity Interests based on their relative ownership interests of the relevant class of such Equity Interests;
- (c) redemptions by Borrower in whole or in part any of its Equity Interests for another class of its Equity Interests or rights to acquire its Equity Interests or with proceeds from substantially concurrent equity contributions or issuances of new Equity Interests;
- (d) any such payments arising from a Permitted Acquisition or other Permitted Investment by Borrower or any of its Subsidiaries;
- (e) payments by any Credit Party or any Subsidiary of a Credit Party to any Credit Party or any Subsidiary of a Credit Party pursuant to Tax sharing agreements among the Credit Parties and their Subsidiaries on customary terms to the extent attributable to the ownership or operation of the Credit Party and their Subsidiaries;
- (f) the payment of dividends by Borrower solely in non-cash pay and non-redeemable capital stock (including, for the avoidance of doubt, dividends and distributions payable solely in Equity Interests);
- (g) cash payments in lieu of the issuance of fractional shares arising out of stock dividends, splits or combinations or in connection with the exercise of warrants, options or other securities convertible into or exchangeable for Equity Interests;
- (h) in connection with any Acquisition or other Investment by Borrower or any of its Subsidiaries, (i) the receipt or acceptance of the return to Borrower or any of its Subsidiaries of Equity Interests of Borrower constituting a portion of the purchase price consideration in settlement of indemnification claims, or as a result of a purchase price adjustment (including earn-outs or similar obligations) and (ii) payments or distributions to equity holders pursuant to appraisal rights required under Requirements of Law;
- (i) the distribution of rights pursuant to any shareholder rights plan or the redemption of such rights for nominal consideration in accordance with the terms of any shareholder rights plan;
- (j) dividends, distributions or payments on its Equity Interests by any Subsidiary to any Credit Party;
- (k) dividends, distributions or payments on its Equity Interests by any Subsidiary that is not a Credit Party to any other Subsidiary that is not a Credit Party;

(l) purchases of Equity Interests of Borrower or its Subsidiaries in connection with the exercise of stock options by way of cashless exercise, or in connection with the satisfaction of withholding tax obligations;

(m) issuance to directors, officers, employees or contractors of Borrower of common stock of Borrower upon the vesting of restricted stock, restricted stock units, or other rights to acquire common stock of Borrower pursuant to plans or agreements approved by Borrower's Board of Directors or stockholders;

(n) the repurchase, retirement or other acquisition or retirement for value of Equity Interests of Borrower or any of its Subsidiaries held by any future, present or former employee, consultant, officer or director (or spouse, ex-spouse or estate of any of the foregoing or trust for the benefit of any of the foregoing or any lineal descendants thereof) of Borrower or any of its Subsidiaries pursuant to any management equity plan or stock option plan or any other management or employee benefit plan or agreement, or any stock subscription or shareholder agreement or employment agreement; provided, however, that the aggregate payments made under this clause (n) do not exceed in any calendar year the sum of [**]; and

(o) dividends or distributions on its Equity Interests by Borrower payable solely in additional Equity Interests.

"Permitted Hedging Agreement" means a Hedging Agreement entered into in the ordinary course of business solely in connection with foreign exchange or interest rate hedging transactions and not for speculative purposes.

"Permitted Indebtedness" means:

(a) Indebtedness of the Credit Parties to Secured Parties under this Agreement and the other Loan Documents;

(b) Indebtedness existing on the Effective Date and shown on Schedule 12.1 of the Disclosure Letter;

(c) Indebtedness of Borrower in the form of a [**].

(d) Indebtedness not to exceed \$[**] in the aggregate at any time outstanding, consisting of (i) Indebtedness incurred to finance the purchase, construction, repair, or improvement of fixed assets and (ii) capital lease obligations;

(e) Indebtedness in connection with corporate credit cards, purchasing cards, commercial cards or bank card products;

(f) guarantees of Permitted Indebtedness;

(g) Indebtedness assumed in connection with any Permitted Acquisition or Permitted Investment, so long as such Indebtedness (i) was not incurred in connection with, or in anticipation of, such Acquisition or Investment and (ii) is at all times Subordinated Debt;

(h) Indebtedness of Borrower or any of its Subsidiaries with respect to letters of credit outstanding and secured solely by cash or Cash Equivalents entered into in the ordinary course of business;

(i) Indebtedness owed (i) by a Credit Party to another Credit Party, (ii) by a Subsidiary of Borrower that is not a Credit Party to another Subsidiary of Borrower that is not a Credit Party, (iii) by a Credit Party to a Subsidiary of Borrower that is not a Credit Party or (iv) by a Subsidiary of Borrower that is not a Credit Party to a Credit Party, [**] in the aggregate at any time outstanding;

(j) Indebtedness consisting of Contingent Obligations set forth in clause (a) of the definition of “Contingent Obligation” (i) of a Credit Party of Permitted Indebtedness (or obligations that are not Indebtedness) of another Credit Party, (ii) of a Subsidiary of Borrower which is not a Credit Party of Permitted Indebtedness (or obligations that are not Indebtedness) of another Subsidiary of Borrower which is not a Credit Party, (iii) of a Subsidiary of Borrower which is not a Credit Party of Permitted Indebtedness (or obligations that are not Indebtedness) of a Credit Party, (iv) of a Credit Party of lease obligations of a Subsidiary of Borrower which is not a Credit Party, or (v) of a Credit Party of Permitted Indebtedness (or obligations that are not Indebtedness) of a Subsidiary of Borrower which is not a Credit Party not to exceed \$[**] in the aggregate at any time outstanding;

(k) Indebtedness consisting of Contingent Obligations (i) set forth in clause (b) of the definition of “Contingent Obligation”, and (ii) set forth in clause (c) of the definition of “Contingent Obligation” in connection with any Permitted Acquisition, not to exceed \$[**] in the aggregate at any time outstanding;

(l) Indebtedness of any Person that becomes a Subsidiary (or of any Person not previously a Subsidiary that is merged or consolidated with or into a Subsidiary in a transaction permitted hereunder) of Borrower after the Effective Date, or Indebtedness of any Person that is assumed after the Effective Date by any Subsidiary in connection with an acquisition of assets by such Subsidiary; provided that such Indebtedness is at all times Subordinated Debt;

(m) (i) Indebtedness with respect to workers’ compensation claims, payment obligations in connection with health, disability or other types of social security benefits, unemployment or other insurance obligations, reclamation and statutory obligations or (ii) Indebtedness related to employee benefit plans, including annual employee bonuses, accrued wage increases and 401(k) plan matching obligations; in each case, incurred in the ordinary course of business consistent with past practice;

(n) Indebtedness in respect of performance bonds, bid bonds, appeal bonds, surety bonds and completion guarantees and similar obligations arising in the ordinary course of business consistent with past practice;

(o) Indebtedness in respect of netting services, overdraft protection and other cash management services, in each case in the ordinary course of business consistent with past practice;

(p) Indebtedness consisting of the financing of insurance premiums in the ordinary course of business consistent with past practice;

(q) Indebtedness consisting of guarantees resulting from endorsement of negotiable instruments for collection by any Credit Party in the ordinary course of business consistent with past practice;

(r) unsecured Indebtedness incurred in connection with any items of Permitted Distributions in clause (m) of the definition of “Permitted Distributions”;

(s) Permitted Convertible Indebtedness in an aggregate principal amount not to exceed \$[**] at any time outstanding;

(t) Permitted Hedging Agreements;

(u) Indebtedness created or arising under any royalty, synthetic royalty or other monetization or similar transaction and in each case incurred solely in connection with any properties or assets which do not constitute Collateral under the Loan Documents, including any of the Other Assets or Excluded Property; provided, however, that any such Indebtedness is non-recourse to Borrower or any other Credit Party; and

(v) subject to the proviso immediately below, extensions, refinancings, modifications, amendments, restatements and, in the case of any items of Permitted Indebtedness in clause (b) of the definition of “Permitted Indebtedness” or Permitted Indebtedness constituting notes governed by an indenture, exchanges, of any items of Permitted Indebtedness in clauses (a) through (u) above, provided, that in the case of clauses (b) and (g) above, the principal amount thereof is not increased (other than by any reasonable amount of premium (if any), interest (including post-petition interest), fees, expenses, charges or additional or contingent interest reasonably incurred in connection with the same and the terms thereof).

“Permitted Investments” means:

- (a) Investments (including Investments in Subsidiaries) existing on the Effective Date and shown on Schedule 12.2 of the Disclosure Letter, and any extensions, renewals or reinvestments thereof;
- (b) Investments consisting of cash and Cash Equivalents;
- (c) Investments consisting of the endorsement of negotiable instruments for deposit or collection or similar transactions in the ordinary course of business consistent with past practice;
- (d) subject to Section 5.5, Investments consisting of deposit accounts or securities accounts;
- (e) Investments in connection with Permitted Transfers and Permitted Indebtedness;
- (f) Investments consisting of (i) travel advances and employee relocation loans and other employee advances in the ordinary course of business consistent with past practice, and (ii) loans to employees, officers or directors relating to the purchase of equity securities of Borrower pursuant to employee stock purchase plans or agreements approved by Borrower’s Board of Directors;
- (g) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of customers or suppliers and in settlement of delinquent obligations of, and other disputes with, customers or suppliers arising in the ordinary course of business consistent with past practice;
- (h) Investments consisting of notes receivable of, or prepaid royalties and other credit extensions, to customers and suppliers who are not Affiliates, in the ordinary course of business consistent with past practice; provided that this clause (h) shall not apply to Investments of any Credit Party in any of its Subsidiaries;
- (i) joint ventures or strategic alliances consisting of the non-exclusive licensing of technology, the development of technology or the providing of technical support;
- (j) Investments (i) required in connection with a Permitted Acquisition (including the formation of any Subsidiary for the purpose of effectuating such Permitted Acquisition, the capitalization of such Subsidiary whether by capital contribution or intercompany loans, in each case, to the extent otherwise permitted by the terms of this Agreement, related Investments in Subsidiaries necessary to consummate such Permitted Acquisition, and the receipt of any non-cash consideration in a Permitted Acquisition), and (ii) consisting of earnest money deposits required in connection with a Permitted Acquisition or other acquisition of properties or assets not otherwise prohibited hereunder;
- (k) Investments constituting the formation of any Subsidiary for the purpose of consummating a merger or acquisition transaction permitted by Section 6.3(a)(i) through (iv) hereof, which such transaction is otherwise a Permitted Investment;
- (l) Investments of any Person that (i) becomes a Subsidiary of Borrower (or of any Person not previously a Subsidiary of Borrower that is merged or consolidated with or into a Subsidiary of Borrower in a transaction permitted hereunder) after the Effective Date, or (ii) are assumed after the Effective Date by any Subsidiary of Borrower in connection with an acquisition of assets from such Person by such Subsidiary, in either case, in a Permitted Acquisition; provided, that in each case, any such Investment (x) exists at the time such Person becomes a Subsidiary of Borrower (or is merged or consolidated with or into a Subsidiary of Borrower) or such assets are acquired, (y) was not made in contemplation of or in connection with such Person becoming a Subsidiary of Borrower (or merging or consolidating with or into a Subsidiary of Borrower) or such acquisition of assets, and (z) could not reasonably be expected to result in a Default or an Event of Default;
- (m) Investments arising as a result of the licensing of Intellectual Property not prohibited hereunder;
- (n) Investments by (i) any Credit Party in any other Credit Party, (ii) any Subsidiary of Borrower which is not a Credit Party in another Subsidiary of Borrower which is not a Credit Party, (iii) any Subsidiary of Borrower which is not a Credit Party in any Credit Party, (iv) any Credit Party in a Subsidiary of Borrower which is not a Credit Party not to exceed \$[**] in the aggregate per fiscal year and (v) [**];

(o) Investments with respect to any properties or assets which do not constitute Collateral under the Loan Documents, including any of the [**] or [**];

(p) Repurchases of capital stock of Borrower or any of its Subsidiaries deemed to occur upon the exercise of options, warrants or other rights to acquire capital stock of Borrower or such Subsidiary solely to the extent that shares of such capital stock represent a portion of the exercise price of such options, warrants or such rights; and

(q) Borrower's entry into (including payments of premiums in connection therewith), and the performance of obligations under, any Permitted Convertible Indebtedness, Permitted Bond Hedge Transactions and Permitted Warrant Transactions, in each case in accordance with its terms;

provided, however, that, none of the foregoing Investments shall be a "Permitted Investment" if any Indebtedness or Liens assumed in connection with such Investment are not otherwise permitted under Section 6.4 or 6.5, respectively.

"Permitted Liens" means:

(a) Liens securing the Obligations pursuant to any Loan Document;

(b) Liens existing on the Effective Date and set forth on Schedule 12.3 of the Disclosure Letter;

(c) Liens for Taxes, assessments or governmental charges (i) which are not yet delinquent or (ii) which are being contested in good faith and by appropriate proceedings promptly instituted and diligently conducted; provided that adequate reserves therefor have been set aside on the books of the applicable Person and maintained in conformity with Applicable Accounting Standards, if required; provided, further, that in the case of a Tax, assessment or charge that has or may become a Lien against any Collateral, such contest proceedings conclusively operate to stay the sale or forfeiture of any portion of any Collateral to satisfy such Tax, assessment or charge;

(d) pledges or deposits made in the ordinary course of business (other than Liens imposed by ERISA) in connection with workers' compensation, payroll taxes, unemployment insurance, old-age pensions, or other similar social security legislation, (ii) pledges or deposits made in the ordinary course of business consistent with past practice securing liability for reimbursement or indemnification obligations of (including obligations in respect of letters of credit or bank guarantees for the benefit of) insurance carriers providing property, casualty or liability insurance to Borrower or any of its Subsidiaries, (iii) subject to Section 6.2(b), statutory or common law Liens of landlords, and (iv) pledges or deposits to secure performance of tenders, bids, leases, statutory or regulatory obligations, surety and appeal bonds, government contracts, performance and return-of-money bonds and other obligations of like nature, in each case other than for borrowed money and entered into in the ordinary course of business consistent with past practice;

(e) Liens arising from attachments or judgments, orders, or decrees in circumstances not constituting an Event of Default under either Section 7.4 or 7.7;

(f) Liens (including the right of set-off) in favor of banks or other financial institutions incurred on deposits made in accounts held at such institutions in the ordinary course of business; provided that such Liens (i) are not given in connection with the incurrence of any Indebtedness, (ii) relate solely to obligations for administrative and other banking fees and expenses incurred in the ordinary course of business in connection with the establishment or maintenance of such accounts and (iii) are within the general parameters customary in the banking industry;

(g) Liens that are contractual rights of set-off (i) relating to pooled deposit or sweep accounts of Borrower or any of its Subsidiaries to permit satisfaction of overdraft or similar obligations incurred in the ordinary course of business consistent with past practice or (ii) relating to purchase orders and other agreements entered into with customers of Borrower or any of its Subsidiaries in the ordinary course of business consistent with past practice;

(h) Liens solely on any cash earnest money deposits made by Borrower or any of its Subsidiaries in connection with any Permitted Acquisition, Permitted Investment or other acquisition of assets or properties not otherwise prohibited under this Agreement;

(i) Liens existing on assets or properties at the time of its acquisition or existing on the assets or properties of any Person at the time such Person becomes a Subsidiary of Borrower, in each case after the Effective Date; provided that (i) neither such Lien was created nor the Indebtedness secured thereby was incurred in contemplation of such acquisition or such Person becoming a Subsidiary of Borrower, (ii) such Lien does not extend to or cover any other assets or properties (other than the proceeds or products thereof and other than after-acquired assets or properties subject to a Lien securing Indebtedness and other obligations incurred prior to such time and which Indebtedness and other obligations are permitted hereunder that requires, pursuant to its terms and conditions in effect at such time, a pledge of after-acquired assets or properties, it being understood that such requirement shall not be permitted to apply to any assets or properties to which such requirement would not have applied but for such acquisition), (iii) the Indebtedness and other obligations secured thereby is permitted under Section 6.4 hereof and (iv) such Liens are of the type otherwise permitted under Section 6.5 hereof;

(j) Liens securing Indebtedness permitted under clause (c) or (v) (solely with respect to extensions, refinancings, modifications, amendments and restatements of Indebtedness permitted under clause (c) of the definition of "Permitted Indebtedness") of the definition of "Permitted Indebtedness";

(k) Liens securing Indebtedness permitted under clause (d)(i) of the definition of "Permitted Indebtedness" (including any extensions, refinancings, modifications, amendments or restatements of such Indebtedness permitted under clause (v) of the definition of "Permitted Indebtedness"); provided, that such Lien does not extend to or cover any assets or properties other than those described in clause (d)(i) of the definition of "Permitted Indebtedness";

(l) servitudes, easements, rights-of-way, restrictions and other similar encumbrances on real property imposed by Requirements of Law and encumbrances consisting of zoning or building restrictions, easements, licenses, restrictions on the use of property or minor defects or other irregularities in title which, in the aggregate, are not material, and which do not in any case materially detract from the value of the property subject thereto or interfere with the ordinary conduct of the business of any Credit Party or any Subsidiary of any Credit Party;

(m) to the extent constituting a Lien, escrow arrangements securing indemnification obligations associated with any Permitted Acquisition or Permitted Investment;

(n) licenses, sublicenses, leases or subleases of personal property (other than relating to Company IP) granted to third parties, in each case that does not materially interfere with the ability of any Credit Party or any of its Subsidiaries to own, license, develop, commercialize or otherwise fully exploit the market potential of the Product in the Territory, and non-exclusive licenses of any Intellectual Property;

(o) Liens on cash or other current assets pledged to secure (i) Indebtedness in respect of corporate credit cards, purchasing cards or bank card products, or (ii) Indebtedness in the form of letters of credit or bank guarantees;

(p) Liens on any properties or assets of Borrower or any of its Subsidiaries which do not constitute Collateral under the Loan Documents, including any of the Other Assets or Excluded Property, other than (i) any Company IP that does not constitute Collateral under the Loan Documents but is in any way required or necessary to own, license, develop, commercialize or otherwise fully exploit the market potential of the Product in the Territory and (ii) Equity Interests of any Subsidiary;

(q) Liens on properties or assets of Borrower or any of its Subsidiaries imposed by law or regulation which were incurred in the ordinary course of business, including landlords', carriers', warehousemen's, mechanics', materialmen's, contractors', suppliers of materials', architects' and repairmen's Liens, and other similar Liens arising in the ordinary course of business consistent with past practice; provided that such Liens (i) do not materially detract from the value of such properties or assets subject thereto or materially impair the use of such properties or assets subject thereto in the operations of the business of Borrower or such Subsidiary or (ii) are being contested in good faith by appropriate proceedings, which conclusively operate to stay the sale or forfeiture of any portion of such properties or assets subject thereto and for which adequate reserves have been set aside on the books of the applicable Person and maintained in conformity with Applicable Accounting Standards, if required; and

(r) subject to the provisos immediately below, the modification, replacement, extension or renewal of the Liens described in clauses (a) through (q) above; provided, however, that any such modification, replacement, extension or renewal must (i) be limited to the assets or properties encumbered by the existing Lien (and any additions, accessions, parts, improvements and attachments thereto and the proceeds thereof) and (ii) not increase the principal amount of any Indebtedness secured by the existing Lien (other than by any reasonable premium or other reasonable amount paid and fees and expenses reasonably incurred in connection therewith); provided, further, that to the extent any of the Liens described in clauses (a) through (q) above secure Indebtedness of a Credit Party, such Liens, and any such modification, replacement, extension or renewal thereof, shall constitute Permitted Liens if and only to the extent that such Indebtedness is permitted under Section 6.4 hereof.

“Permitted Negative Pledges” means:

- (a) prohibitions or limitations with regards to specific properties or assets encumbered by Permitted Liens, if and only to the extent each such prohibition or limitation applies only to such properties or assets;
- (b) prohibitions or limitations set forth in any lease, license or other similar agreement not prohibited hereunder;
- (c) prohibitions or limitations relating to Permitted Indebtedness, in the case of each such agreement if and only to the extent such prohibitions or limitations, taken as a whole, are not materially more restrictive than the prohibitions and limitations set forth in this Agreement and the other Loan Documents, taken as a whole (as reasonably determined by a Responsible Officer of Borrower in good faith);
- (d) customary provisions restricting assignments, subletting, sublicensing or other transfer of properties or assets subject thereto set forth in leases, subleases, licenses and other similar agreements that are not otherwise prohibited under this Agreement or any other Loan Document, if and only to the extent each such restriction applies only to the properties or assets subject to such leases, subleases, licenses or agreements, and customary provisions restricting assignment, pledges or transfer of any agreement entered into in the ordinary course of business consistent with past practice;
- (e) prohibitions or limitations imposed by Requirements of Law;
- (f) prohibitions or limitations that exist as of the Effective Date under Indebtedness existing on the Effective Date;
- (g) customary prohibitions or limitations arising in connection with any Permitted Transfer or contained in any agreement relating to any Permitted Transfer pending the consummation of such Permitted Transfer;
- (h) customary provisions in shareholders’ agreements, joint venture agreements, organizational documents or similar binding agreements relating to, or any agreement evidencing Indebtedness of, any joint venture entity or non-Wholly-Owned Subsidiary and applicable solely to such joint venture entity or non-Wholly-Owned Subsidiary and the Equity Interests issued thereby;
- (i) customary net worth provisions set forth in real property leases entered into by Subsidiaries of Borrower, so long as such net worth provisions could not reasonably be expected to impair the ability of Borrower or its Subsidiaries to meet their ongoing obligations (as reasonably determined by a Responsible Officer of Borrower in good faith);
- (j) customary net worth provisions set forth in customer agreements entered into in the ordinary course of business consistent with past practice that are not otherwise prohibited under this Agreement or any other Loan Document, so long as such net worth provisions could not reasonably be expected to impair the ability of Borrower or its Subsidiaries to meet their ongoing obligations (as reasonably determined by a Responsible Officer of Borrower in good faith);
- (k) restrictions on cash or other deposits (including escrowed funds) imposed by agreements entered into in the ordinary course of business consistent with past practice that are not otherwise prohibited under this Agreement or any other Loan Document;

(l) prohibitions or limitations set forth in any agreement in effect at the time any Person becomes a Subsidiary (but not any amendment, modification, restatement, renewal, extension, supplement or replacement expanding the scope of any such restriction or condition); provided that such agreement was not entered into in contemplation of such Person becoming a Subsidiary and each such prohibition or limitation does not apply to Borrower or any other Subsidiary (other than such Person and any other Person that is a Subsidiary of such first Person at the time such first Person becomes a Subsidiary);

(m) prohibitions or limitations imposed by any Loan Document;

(n) customary provisions set forth in joint venture agreements or agreements governing minority investments that are not otherwise prohibited by this Agreement or any other Loan Document, if and only to the extent each such prohibition or limitation applies only to the joint venture entity or minority investment that is the subject of such agreement;

(o) limitations imposed with respect to any license acquired in a Permitted Acquisition;

(p) customary provisions restricting assignments or other transfer of properties or assets subject thereto set forth in any agreement entered into in the ordinary course of business consistent with past practice, if and only to the extent each such restriction applies only to the properties or assets subject to such agreement;

(q) prohibitions or limitations imposed by any agreement evidencing any Permitted Indebtedness of the type described in any of clause (d) of the definition of "Permitted Indebtedness"; and

(r) prohibitions or limitations imposed by any amendments, modifications, restatements, renewals, extensions, supplements or replacements of any of the agreements referred to in clauses (a) through (p) above, except to the extent that any such amendment, modification, restatement, renewal, extension, supplement or replacement expands the scope of any such prohibition or limitation.

"Permitted Subsidiary Distribution Restrictions" means, in each case notwithstanding Section 6.8:

(a) prohibitions or limitations with regards to specific properties or assets encumbered by Permitted Liens, if and only to the extent each such prohibition or limitation applies only to such properties or assets;

(b) prohibitions or limitations set forth in any lease, license or other similar agreement not prohibited hereunder;

(c) prohibitions or limitations relating to Permitted Indebtedness, in the case of each such agreement if and only to the extent such prohibitions or limitations, taken as a whole, are not materially more restrictive than the prohibitions and limitations set forth in this Agreement and the other Loan Documents, taken as a whole (as reasonably determined by a Responsible Officer of Borrower in good faith);

(d) customary provisions restricting assignments, subletting, sublicensing or other transfer of properties or assets subject thereto set forth in leases, subleases, licenses and other similar agreements that are not otherwise prohibited under this Agreement or any other Loan Document, if and only to the extent each such restriction applies only to the properties or assets subject to such leases, subleases, licenses or agreements, and customary provisions restricting assignment, pledges or transfer of any agreement entered into in the ordinary course of business consistent with past practice;

(e) prohibitions or limitations on the transfer or assignment of any properties, assets or Equity Interests set forth in any agreement entered into in the ordinary course of business consistent with past practice that is not otherwise prohibited under this Agreement or any other Loan Document, if and only to the extent each such prohibition or limitation applies only to such properties, assets or Equity Interests;

(f) prohibitions or limitations imposed by Requirements of Law;

(g) prohibitions or limitations that exist as of the Effective Date under Indebtedness existing on the Effective Date;

(h) customary prohibitions or limitations arising in connection with any Permitted Transfer or contained in any agreement relating to any Permitted Transfer pending the consummation of such Permitted Transfer;

(i) customary provisions in shareholders' agreements, joint venture agreements, organizational documents or similar binding agreements relating to, or any agreement evidencing Indebtedness of, any joint venture entity or non-Wholly-Owned Subsidiary and applicable solely to such joint venture entity or non-Wholly-Owned Subsidiary and the Equity Interests issued thereby;

(j) customary net worth provisions set forth in real property leases entered into by Subsidiaries of Borrower, so long as such net worth provisions could not reasonably be expected to impair the ability of Borrower or its Subsidiaries to meet their ongoing obligations (as reasonably determined by a Responsible Officer of Borrower in good faith);

(k) customary net worth provisions set forth in customer agreements entered into in the ordinary course of business consistent with past practice that are not otherwise prohibited under this Agreement or any other Loan Document, so long as such net worth provisions could not reasonably be expected to impair the ability of Borrower or its Subsidiaries to meet their ongoing obligations (as reasonably determined by a Responsible Officer of Borrower in good faith);

(l) restrictions on cash or other deposits (including escrowed funds) imposed by agreements entered into in the ordinary course of business consistent with past practice that are not otherwise prohibited under this Agreement or any other Loan Document;

(m) prohibitions or limitations set forth in any agreement in effect at the time any Person becomes a Subsidiary (but not any amendment, modification, restatement, renewal, extension, supplement or replacement expanding the scope of any such restriction or condition); provided that such agreement was not entered into in contemplation of such Person becoming a Subsidiary and each such prohibition or limitation does not apply to Borrower or any other Subsidiary (other than such Person and any other Person that is a Subsidiary of such first Person at the time such first Person becomes a Subsidiary);

(n) prohibitions or limitations imposed by any Loan Document;

(o) customary provisions set forth in joint venture agreements or agreements governing minority investments that are not otherwise prohibited by this Agreement or any other Loan Document, if and only to the extent each such prohibition or limitation applies only to the joint venture entity or minority investment that is the subject of such agreement;

(p) customary provisions restricting assignments or other transfer of properties or assets subject thereto set forth in any agreement entered into in the ordinary course of business consistent with past practice, if and only to the extent each such restriction applies only to the properties or assets subject to such agreement;

(q) prohibitions or limitations imposed by any agreement evidencing any Permitted Indebtedness of the type described in any of clause (d) of the definition of "Permitted Indebtedness"; and

(r) prohibitions or limitations imposed by any amendments, modifications, restatements, renewals, extensions, supplements or replacements of any of the agreements referred to in clauses (a) through (p) above, except to the extent that any such amendment, modification, restatement, renewal, extension, supplement or replacement expands the scope of any such prohibition or limitation.

"Permitted Transfers" means:

(a) Transfers of any properties or assets which do not constitute Collateral under the Loan Documents, including any Company IP that does not constitute Collateral or Other Assets [**];

(b) Transfers of Inventory in the ordinary course of business consistent with past practice;

(c) Transfers of surplus, damaged, worn out or obsolete equipment that is, in the reasonable judgment of Borrower exercised in good faith, no longer economically practicable to maintain or useful in the ordinary course of business consistent with past practice, and Transfers of other properties or assets in lieu of any pending or threatened institution of any proceedings for the condemnation or seizure of such properties or assets or for the exercise of any right of eminent domain;

(d) Transfers made in connection with Permitted Liens;

(e) Transfers of cash and Cash Equivalents in the ordinary course of business for equivalent value and in a manner that is not prohibited by the terms of this Agreement or the other Loan Documents;

(f) Transfers (i) between or among Credit Parties, provided that, with respect to any properties or assets constituting Collateral under the Loan Documents (including, for the avoidance of doubt, any Equity Interests constituting Collateral issued by any Subsidiary which are owned or otherwise held by a Credit Party), any and all steps as may be required to be taken in order to create and maintain a first priority security interest in and Lien upon such properties and assets in favor of the Collateral Agent for the benefit of Lenders and the other Secured Parties are taken contemporaneously with the completion of any such Transfer, and (ii) between or among non-Credit Parties;

(g) the sale or issuance of Equity Interests of any Subsidiary of Borrower to any Credit Party or Subsidiary, provided, that any such sale or issuance by a Credit Party shall be to another Credit Party, provided, further, that, with respect to any such Equity Interests which constitute Collateral under the Loan Documents with the completion of such sale or issuance, any and all steps as may be required to be taken, if any, in order to create and maintain a first priority security interest in and Lien upon such Equity Interests in favor of the Collateral Agent for the benefit of Lenders and the other Secured Parties are taken contemporaneously with the completion of any such sale or issuance;

(h) the discount without recourse or sale or other disposition of unpaid and overdue accounts receivable arising in the ordinary course of business consistent with past practice in connection with the compromise, collection or settlement thereof and not part of a financing transaction;

(i) any abandonment, cancellation, non-renewal or discontinuance of use or maintenance of Company IP that Borrower reasonably determines in good faith (i) is no longer economically practicable to maintain or useful in the ordinary course of business consistent with past practice and that (ii) could not reasonably be expected to be adverse to the rights, remedies and benefits available to, or conferred upon, the Collateral Agent or any Lender under any Loan Document in any material respect;

(j) Transfers by Borrower or any of its Subsidiaries pursuant to: (i) a non-exclusive license of Intellectual Property or a non-exclusive grant of development, manufacturing, production, commercialization, marketing, co-promotion, distribution, sale or similar commercial rights to third parties in the ordinary course of business consistent with general market practice, provided, however, that in each case to the extent relating to any Product with respect to geography within the Territory, Borrower consolidates revenues from the sale of such Product in the Territory in accordance with Applicable Accounting Standards and Borrower or any of its Subsidiaries controls the pricing for such Product in the Territory; (ii) an exclusive license of Intellectual Property or an exclusive grant of development, manufacturing, production, commercialization, marketing, co-promotion, distribution, sale or similar commercial rights, to third parties, in each case except to the extent relating in any way to any Product with respect to geography within the Territory; (iii) a non-exclusive license of technology or Intellectual Property to third parties for developing technology or providing technical support in the ordinary course of business consistent with general market practice, in each case except to the extent relating in any way to any Product with respect to geography within the Territory; and (iv) a non-exclusive or an exclusive manufacturing license to third parties in the ordinary course of business consistent with general market practice, in each case except to the extent relating in any way to any Product with respect to geography within the Territory; provided, that an exclusive or non-exclusive license out of Intellectual Property relating to any Product with respect to geography outside of the Territory that is not otherwise prohibited under this Agreement or any other Loan Document shall constitute a Permitted Transfer; provided, further, that (x) a Transfer of Intellectual Property unrelated in any way to any Product with respect to geography within or outside the Territory that is not otherwise prohibited under this Agreement or any other Loan Document and (y) [**]; and

(k) intercompany licenses or grants of rights of distribution, co-promotion or similar commercial rights (i) between or among the Credit Parties, or (ii) between or among the Credit Parties and Subsidiaries that are not Credit Parties entered into prior to the Effective Date, and renewals, replacements and extensions thereof (including additional licenses or grants in relation to new territories) on comparable terms in the ordinary course of business consistent with past practice.

“Permitted Warrant Transaction” means any call option, warrant or right to purchase (or substantively equivalent derivative transaction) relating to Borrower’s common stock (or other securities or property following a merger event or other change of the common stock of Borrower) or cash or any combination thereof (with the amount of such cash or such combination determined by reference to the market price of such common stock or other securities) sold by Borrower substantially concurrently with any purchase by Borrower of a related Permitted Bond Hedge Transaction.

“Person” means any individual, sole proprietorship, partnership, limited liability company, joint venture, company, trust, unincorporated organization, association, corporation, institution, public benefit corporation, firm, joint stock company, estate, entity or government agency.

“Pharmakon Lender” means BioPharma Credit PLC, BioPharma Credit Investments V (Master) LP and any of their respective Controlled Investment Affiliates.

“Plan” means any employee pension benefit plan (other than a Multiemployer Plan) subject to the provisions of Title IV of ERISA or Section 412 of the IRC or Section 302 of ERISA which is maintained or contributed to by Borrower or its Subsidiaries or their respective ERISA Affiliates or with respect to which Borrower or its Subsidiaries have any liability (including under Section 4069 of ERISA).

“Prepayment Premium” means the Tranche A Prepayment Premium or the Tranche B Prepayment Premium (as applicable) or any combination thereof, as the context dictates.

“Private Third Party Payor Programs” means all U.S. third party payor programs in which any Credit Party or its Subsidiaries participates, including managed care plans, or any other private insurance programs, but excluding all Governmental Payor Programs.

“Product” means [**] Auryxia® (ferric citrate), [**] for use in the control of serum phosphorus levels in adult patients with chronic kidney disease on dialysis, [**] for use in the treatment of iron deficiency anemia in adult patients with chronic kidney disease not on dialysis, [**]; provided, that Product does not contain a controlled substance (as that term is defined under the Controlled Substances Act (21 U.S.C. § 801 et seq.)).

“Product Net Sales” means, solely with respect to sales of Product as of any date of determination, the net consolidated product revenue (consistent with the calculation of same in the Borrower’s financial statements) of Borrower and its Subsidiaries of Product for the period in question occurring either prior to or after such date [**], as the context dictates, determined on a consolidated basis in accordance with Applicable Accounting Standards as set forth in Borrower’s financial statements or as otherwise evidenced in a manner reasonably satisfactory to the Required Lenders.

“Register” is defined in Section 2.8(a).

“Registered Organization” means any “registered organization” as defined in the Code with such additions to such term as may hereafter be made.

“Regulatory Agency” means a U.S. Governmental Authority with responsibility for the approval of the marketing and sale of pharmaceuticals or other regulation of pharmaceuticals, including the FDA.

“Regulatory Approval” means all approvals, product or establishment licenses, registrations or authorizations of any Regulatory Agency necessary for the manufacture, use, storage, import, export, transport, offer for sale, or sale of the Product.

“Related Parties” means, with respect to any Person, such Person’s Affiliates and the partners, directors, officers, employees, agents, trustees, administrators, managers, advisors and representatives of such Person and of such Person’s Affiliates.

“**Release**” means any release, spill, emission, leaking, pumping, pouring, injection, escaping, deposit, disposal, discharge, dispersal, dumping, leaching or migration of any Hazardous Material into the indoor or outdoor environment (including the abandonment or disposal of any barrels, containers or other closed receptacles containing any Hazardous Material), including the movement of any Hazardous Material through the air, soil, surface water or groundwater, in each case, in the United States.

“**Required Lenders**” means, prior to the Closing Date, Lenders obligated with respect to greater than fifty percent (50%) of the Term Loan Commitments and, thereafter, Lenders representing greater than fifty percent (50%) of the outstanding principal amount of the Term Loans.

“**Requirements of Law**” means, as to any Person, the organizational or governing documents of such Person, and any law (statutory or common), treaty, order, policy, rule or regulation or determination of an arbitrator or a court or other Governmental Authority (including Health Care Laws, Data Protection Laws, FDA Laws, and all applicable statutes, rules, regulations, standards, guidelines, policies and orders administered or issued by any foreign Governmental Authority), in each case, applicable to and binding upon such Person or any of its assets or properties or to which such Person or any of its assets or properties are subject.

“**Responsible Officers**” means, with respect to Borrower, collectively, the Chief Executive Officer, President, Chief Commercial Officer, Chief Medical Officer, Chief Business Officer, Chief Legal Officer and Chief Financial Officer.

“**Sanctions**” is defined in Section 4.18(c).

“**SEC**” shall mean the Securities and Exchange Commission and any analogous Governmental Authority.

“**Secured Parties**” means each Lender, each other Indemnified Person and each other holder of any Obligation of a Credit Party.

“**Securities Account**” means any “securities account” as defined in the Code with such additions to such term as may hereafter be made.

“**Securities Act**” means the Securities Act of 1933.

“**Security Agreement**” means the Guaranty and Security Agreement, dated as of the Closing Date, by and among the Credit Parties and the Collateral Agent, in form and substance substantially similar to Exhibit C attached hereto or in such form or substance as the Credit Parties and the Collateral Agent may otherwise agree.

“**Solvent**” means, with respect to any Person as of any date of determination, that, as of such date, (a) the value of the assets (including goodwill minus disposition costs) of such Person (both at fair value and present fair saleable value), on a going concern basis, is greater than the total amount of liabilities (including contingent and unliquidated liabilities) of such Person, (b) such Person is able to generally pay all liabilities (including trade debt) of such Person as such liabilities become absolute and mature in the ordinary course of business consistent with past practice and (c) such Person does not have unreasonably small capital after giving due consideration to the prevailing practice in the industry in which it is engaged or will be engaged. In computing the amount of contingent or unliquidated liabilities at any time, such liabilities shall be computed at the amount that, in light of all the facts and circumstances existing at such time, represents the amount that can reasonably be expected to become an actual or matured liability.

“**Specified Disputes**” is defined in Section 4.6(i).

“**SSA**” means the Social Security Act of 1935, codified at Title 42, Chapter 7, of the United States Code.

“**Stock Acquisition**” means the purchase or other acquisition by Borrower or any of its Subsidiaries of all of the Equity Interests (by merger, stock purchase or otherwise) of any other Person.

“**Subordinated Debt**” means any Indebtedness in the form of or otherwise constituting term debt incurred by any Credit Party or any Subsidiary thereof (including any Indebtedness incurred in connection with any Acquisition

or other Investment) that: (a) is subordinated in right of payment to the Obligations at all times until all of the Obligations have been paid, performed or discharged in full and Borrower has no further right to obtain any Credit Extension hereunder pursuant to a subordination, intercreditor or other similar agreement that is in form and substance reasonably satisfactory to the Collateral Agent (which agreement shall include turnover provisions that are reasonably satisfactory to the Collateral Agent); (b) except as permitted by clause (d) below, is not subject to scheduled amortization, redemption (mandatory), sinking fund or similar payment and does not have a final maturity, in each case, before a date that is at least [**] following the Term Loan Maturity Date; (c) does not include covenants and agreements (other than with respect to maturity, amortization, pricing and other economic terms) that, taken as a whole, are more restrictive or onerous on the Credit Parties in any material respect than the comparable covenants and agreements in the Loan Documents, taken as a whole (as reasonably determined by a Responsible Officer of Borrower in good faith); (d) is not subject to repayment or prepayment, including pursuant to a put option exercisable by the holder of any such Indebtedness, prior to a date that is at least [**] following the final maturity thereof except in the case of an event of default or change of control (or the equivalent thereof, however described); and (e) does not provide or otherwise include provisions having the effect of providing that a default or event of default (or the equivalent thereof, however described) under or in respect of such Indebtedness shall exist, or such Indebtedness shall otherwise become due prior to its scheduled maturity or the holder or holders thereof or any trustee or agent on its or their behalf shall be permitted (with or without the giving of notice, the lapse of time or both) to cause any such Indebtedness to become due, or to require the prepayment, repurchase, redemption or defeasance thereof, prior to its scheduled maturity, in any such case upon the occurrence of a Default or Event of Default hereunder unless and until the Obligations have been declared, or have otherwise automatically become, immediately due and payable pursuant to Section 8.1(a). Notwithstanding the foregoing, Permitted Convertible Indebtedness shall not constitute Subordinated Debt.

“**Subsidiary**” means, with respect to any Person, a corporation, partnership, limited liability company or other entity of which more than [**] of whose shares of stock or other ownership interests having ordinary voting power (other than stock or such other ownership interests having such power only by reason of the happening of a contingency) to elect a majority of the Board of Directors (or similar body) of such corporation, partnership or other entity are at the time owned, directly or indirectly through one or more intermediaries, or both, by such Person. Unless the context otherwise requires, each reference to a Subsidiary herein shall be a reference to a Subsidiary of a Credit Party.

“**Tax**” means any present or future taxes, levies, imposts, duties, deductions, withholdings (including backup withholding), assessments, fees or other charges imposed by any Governmental Authority, including any interest, additions to tax or penalties applicable thereto.

“**Term Loan**” means each of the Tranche A Loan and the Tranche B Loan, as applicable, and “**Term Loans**” means, collectively, the Tranche A Loan and the Tranche B Loan (to the extent funded).

“**Term Loan Commitment**” mean each of the Tranche A Loan Commitment and the Tranche B Loan Commitment, as applicable, and “**Term Loan Commitments**” means, collectively, the Tranche A Loan Commitment and the Tranche B Loan Commitment.

“**Term Loan Maturity Date**” means the 60th-month anniversary of the Tranche A Closing Date; provided, however, that the Term Loan Maturity Date shall be decreased by the number of days equal to the Amortization Reduction Days.

“**Term Loan Note**” is defined in Section 2.8(b).

“**Term Loan Rate**” is defined in Section 2.3(a)(i).

“**Territory**” means, with respect to the Product, the United States.

“**Third Party IP**” is defined in Section 4.6(l).

“**Trademark License**” means any agreement, whether written or oral, providing for the grant by or to a Person of any right to use any Trademark.

“**Trademarks**” means (a) all trademarks, trade names, corporate names, company names, business names, fictitious business names, service marks, elements of package or trade dress of goods or services, logos and other source or business identifiers, together with the goodwill associated therewith, all registrations and recordings thereof, and all applications in connection therewith, in the United States Patent and Trademark Office or in any similar office or agency of the United States or any state thereof or in any similar office or agency anywhere in the world in which foreign counterparts are registered or issued, and (b) all renewals thereof.

“**Tranche A Closing Date**” means the date on which the Tranche A Loan is advanced by Lenders, which, subject to the satisfaction of the conditions precedent to the Tranche A Loan set forth in Section 3.1, Section 3.3 and Section 3.5, shall be ten (10) Business Days following the Effective Date.

“**Tranche A Commitment**” means, with respect to any Lender, the commitment of such Lender to make the Credit Extensions relating to the Tranche A Loan on the Tranche A Closing Date in the aggregate principal amount set forth opposite such Lender’s name on Exhibit E attached hereto.

“**Tranche A Loan**” is defined in Section 2.2(a)(i).

“**Tranche A Loan Amount**” means an original principal amount equal to Eighty Million Dollars (\$80,000,000.00).

“**Tranche A Makewhole Amount**” means, as of any date of determination occurring prior to the 2nd-year anniversary of the Tranche A Closing Date, an amount equal to the sum of all interest that would have accrued and been payable from such date through the 2nd-year anniversary of the Tranche A Closing Date on the amount of principal prepaid.

“**Tranche A Note**” means a promissory note in substantially the form attached hereto as Exhibit B-1, as it may be amended, restated, supplemented or otherwise modified from time to time.

“**Tranche A Prepayment Premium**” means, with respect to any prepayment of the Tranche A Loan by Borrower pursuant to Section 2.2(c) or as a result of the acceleration of the maturity of the Term Loans pursuant to Section 8.1(a), an amount equal to the product of the amount of such prepayment, multiplied by:

(a) if such prepayment occurs prior to the 3rd-year anniversary of the Tranche A Closing Date, 0.02;

(b) if such prepayment occurs on or after the 3rd-year anniversary of the Tranche A Closing Date but prior to the 4th-year anniversary of the Tranche A Closing Date, 0.01; and

(c) if such prepayment occurs on or after the 4th-year anniversary of the Tranche A Closing Date but prior to the 5th-year anniversary of the Tranche A Closing Date, 0.005.

For the avoidance of doubt, no Tranche A Prepayment Premium shall be due and owing for any payment of the Tranche A Loan made on the Term Loan Maturity Date.

“**Tranche B Closing Date**” means the date on which the Tranche B Loan is advanced by Lenders, which, as indicated in the Payment/Advance Form for the Tranche B Loan and subject to the satisfaction of the conditions precedent to the Tranche B Loan set forth in Section 3.2, Section 3.3 and Section 3.5, shall be fifteen (15) days (or such shorter period as may be agreed to by Lenders) following the delivery by Borrower to the Collateral Agent of a completed Payment/Advance Form in the form of Exhibit A hereto for the Tranche B Loan and, in no event, later than December 31, 2020.

“**Tranche B Commitment**” means, with respect to any Lender, the commitment of such Lender to make the Credit Extensions relating to the Tranche B Loan on the Tranche B Closing Date in the aggregate principal amount set forth opposite such Lender’s name on Exhibit E attached hereto; provided, however, that the parties hereto agree that such commitment, and any obligations of such Lender hereunder with respect thereto, shall terminate automatically without any further action by any party hereto and be of no further force and effect if any prepayment of the Tranche A Loan is made, in whole or in part, on or before the Tranche B Closing Date or Borrower has entered into a working capital or revolving loan facility, or otherwise incurred any Indebtedness, of the type described in clause (c) of the definition of “Permitted Indebtedness” (in which of either such case, for purposes of this Agreement, such Lender’s Tranche B Commitment would equal zero).

“**Tranche B Loan**” is defined in Section 2.2(a)(ii).

“**Tranche B Loan Amount**” means an original principal amount equal to Twenty Million Dollars (\$20,000,000.00).

“**Tranche B Makewhole Amount**” means, as of any date of determination occurring prior to the 2nd-year anniversary of the Tranche B Closing Date, an amount equal to the sum of all interest that would have accrued and been payable from such date through the 2nd-year anniversary of the Tranche B Closing Date on the amount of principal prepaid.

“**Tranche B Note**” means a promissory note in substantially the form attached hereto as Exhibit B-2, as it may be amended, restated, supplemented or otherwise modified from time to time.

“**Tranche B Prepayment Premium**” means, with respect to any prepayment of the Tranche B Loan by Borrower pursuant to Section 2.2(c) or as a result of the acceleration of the maturity of the Term Loans pursuant to Section 8.1(a), an amount equal to the product of the amount of such prepayment, multiplied by:

(a) if such prepayment occurs prior to the 3rd-year anniversary of the Tranche B Closing Date, 0.02;

(b) if such prepayment occurs on or after the 3rd-year anniversary of the Tranche B Closing Date but prior to the 4th-year anniversary of the Tranche A Closing Date, 0.01; and

(c) if such prepayment occurs on or after the 4th-year anniversary of the Tranche B Closing Date but prior to the 5th-year anniversary of the Tranche A Closing Date, 0.005.

For the avoidance of doubt, no Tranche B Prepayment Premium shall be due and owing for any payment of the Tranche B Loan made on the Term Loan Maturity Date.

“**Transfer**” is defined in Section 6.1.

“**Treasury Regulations**” mean those regulations promulgated pursuant to the IRC.

“**TRICARE**” means a program of medical benefits covering former and active members of the uniformed services and certain of their dependents, financed and administered by the United States Departments of Defense, Health and Human Services and Transportation.

“**UKBA**” is defined in Section 4.18(a).

“**United States**” or “**U.S.**” means the United States of America, its fifty (50) states, the District of Columbia, Puerto Rico or any other jurisdiction within the United States of America.

“**voting Equity Interests**” means, with respect to any issuer, the issued and outstanding shares of each class of Equity Interests of such issuer entitled to vote.

“**Wholly-Owned Subsidiary**” means, with respect to any Person, a Subsidiary of such Person, all of the Equity Interests of which (other than directors’ qualifying shares or nominee or other similar shares required pursuant to Requirements of Law) are owned by such Person or another Wholly-Owned Subsidiary of such Person. Unless the context otherwise requires, each reference to a Wholly-Owned Subsidiary herein shall be a reference to a Wholly-Owned Subsidiary of a Credit Party.

“**Withdrawal Liability**” means liability to a Multiemployer Plan as a result of a complete or partial withdrawal from such Multiemployer Plan, as such terms are defined in Part I of Subtitle E of Title IV of ERISA.

[Signature page follows.]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the Effective Date.

AKEBIA THERAPEUTICS, INC.,
as Borrower

By /s/ Jason A. Amello

Name: Jason A. Amello

Title: Senior Vice President, Chief Financial Officer and Treasurer

Signature Page to Loan Agreement

**KERYX BIOPHARMACEUTICALS, INC.,
as an additional Credit Party**

By /s/ Jason A. Amello

Name: Jason A. Amello

Title: Chief Financial Officer

Signature Page to Loan Agreement

**BIOPHARMA CREDIT PLC,
as Collateral Agent and Lender**

By: Pharmakon Advisors, LP,
its Investment Manager

By: Pharmakon Management I, LLC,
its General Partner

By /s/ Pedro Gonzalez de Cosio
Name: Pedro Gonzalez de Cosio
Title: CEO and Managing Member

**BIOPHARMA CREDIT INVESTMENTS V (MASTER) LP,
as Lender**

By: Pharmakon Advisors, LP,
its Investment Manager

By: Pharmakon Management I, LLC,
its General Partner

By /s/ Pedro Gonzalez de Cosio
Name: Pedro Gonzalez de Cosio
Title: CEO and Managing Member

Signature Page to Loan Agreement

Certain identified information has been marked in the exhibit because it is both (i) not material and (ii) would likely cause competitive harm to the Company, if publicly disclosed. Double asterisks denote omissions.

EXECUTION VERSION

GUARANTY AND SECURITY AGREEMENT

Dated as of November 25, 2019

by

AKEBIA THERAPEUTICS, INC.

(as *Borrower*),

KERYX BIOPHARMACEUTICALS, INC.

(as a Guarantor)

and

EACH OTHER GRANTOR
FROM TIME TO TIME PARTY HERETO

in favor of

BIOPHARMA CREDIT PLC

(as *Collateral Agent* on behalf of Lenders and the other Secured Parties)

GUARANTY AND SECURITY AGREEMENT, dated as of November 25, 2019, by AKEBIA THERAPEUTICS, INC., a Delaware corporation ("Borrower"), KERYX BIOPHARMACEUTICALS, INC., a Delaware corporation (as a Guarantor) and each other Person that becomes a party hereto pursuant to Section 8.6 (together with Borrower and such Guarantors, "Grantors"), in favor of BIOPHARMA CREDIT PLC, a public limited company incorporated under the laws of England and Wales (as the "Collateral Agent") on behalf of Lenders and each other Secured Party.

WITNESSETH:

WHEREAS, pursuant to the Loan Agreement dated as of November 11, 2019 (as the same may be amended, restated, amended and restated, supplemented or otherwise modified from time to time, the "Loan Agreement") by and among Borrower, the Collateral Agent and the other parties thereto, Lenders agrees to make extensions of credit to Borrower upon the terms and subject to the conditions set forth therein;

WHEREAS, each Grantor other than Borrower agrees to guaranty, jointly and severally, the Obligations (as defined in the Loan Agreement) of Borrower;

WHEREAS, each Grantor will derive substantial direct and indirect benefits from the making of the extensions of credit under the Loan Agreement; and

WHEREAS, it is a condition precedent to the obligation of Lenders to extend credit to Borrower under the Loan Agreement that the Grantors shall have executed and delivered this Agreement to the Collateral Agent and each Lender for the benefit of Lenders and the other Secured Parties.

NOW, THEREFORE, in consideration of the mutual premises herein contained and for valuable consideration the receipt and sufficiency of which is hereby acknowledged and to induce the Collateral Agent, Lenders and the Credit Parties to enter into the Loan Agreement and to induce each Lender to make extensions of credit to Borrower thereunder, each Grantor hereby agrees with the Collateral Agent, each intending to be legally bound, as follows:

ARTICLE I

DEFINED TERMS

Section 1.1. Definitions. Capitalized terms used herein without definition are used as defined in the Loan Agreement.

(a) The following terms have the meanings given to them in the Code and terms used herein without definition that are defined in the Code have the meanings given to them in the Code (such meanings to be equally applicable to both the singular and plural forms of the terms defined): "account", "account debtor", "as-extracted collateral", "certificated security", "chattel paper", "check", "commercial tort claim", "commodity account", "commodity contract", "documents", "deposit account", "electronic chattel paper", "encumbrance", "entitlement holder", "equipment", "farm products", "financial asset", "fixture", "general intangible", "goods", "health-care-insurance receivable", "instruments", "inventory", "investment property", "letter of credit", "letter-of-credit right", "money", "proceeds", "promissory note", "record", "securities account", "security", "security entitlement", "supporting obligation", "tangible chattel paper" and "uncertificated security".

(b) The following terms shall have the following meanings:

"Agreement" means this Guaranty and Security Agreement, as it may be amended, restated, supplemented or otherwise modified from time to time.

"Applicable IP Office" means the United States Patent and Trademark Office or the United States Copyright Office, as the context dictates.

“Collateral” has the meaning specified in Section 3.1.

“Excluded Property” means, collectively:

(i) any “intent to use” United States Trademark applications for which a statement of use or an amendment to allege use has not been filed (but only until such statement is filed) solely to the extent, if any, that, and only during the period, if any, in which, the grant of a security interest therein would impair the validity or enforceability of such intent to use Trademark applications under applicable federal law;

(ii) any permit, lease, license, contract, instrument or other agreement held by any Grantor with respect to which, the grant to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, of a security interest therein and Lien thereupon, and the pledge to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, thereof, to secure the Obligations (and any guaranty thereof) are validly prohibited by the terms thereof, but only, in each case, to the extent, and for so long as, such prohibition is not terminated or rendered unenforceable or otherwise deemed ineffective by the Code (including Sections 9-406(d), 9-407(a), 9-408(a) and 9-409 of the Code) or by any applicable Requirements of Law;

(iii) any permit, lease, license, contract, instrument or other agreement held by any Grantor with respect to which, the grant to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, of a security interest in and Lien thereupon, and the pledge to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, thereof, to secure the Obligations (and any guaranty thereof) require the consent, approval or waiver of any Governmental Authority or other third party (other than Borrower or an Affiliate of Borrower) and such consent, approval or waiver has not been obtained by such Grantor or Borrower following their respective commercially reasonable efforts to obtain the same;

(iv) any other asset or property subject or purported to be subject to a Lien under any Collateral Document held by any Grantor with respect to which, the grant to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, of a security interest in and Lien thereupon, and the pledge to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, thereof, to secure the Obligations (and any guaranty thereof) require the consent, approval or waiver of any Governmental Authority or other third party (other than Borrower or an Affiliate of Borrower) and such consent, approval or waiver has not been obtained by such Grantor or Borrower following their respective commercially reasonable efforts to obtain the same;

(v) any property or asset subject or purported to be subject to a Lien under any Collateral Document held by any Grantor that is a non-Wholly-Owned Subsidiary with respect to which, the grant to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, of a security interest therein and Lien thereupon, and the pledge to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, thereof, to secure the Obligations (and any guaranty thereof) are validly prohibited by, or would give any third party (other than Borrower or an Affiliate of Borrower) the right to terminate its obligations under, the Operating Documents of, the joint venture agreement or shareholder agreement with respect to, or any other contract with such third party relating to such non-Wholly-Owned Subsidiary (other than customary non-assignment provisions which are ineffective under Article 9 of the Code or other Requirements of Law), but only, in each case, to the extent, and for so long as such Operating Documents, joint venture agreement, shareholder agreement or other contract is in effect;

(vi) any asset or property subject or purported to be subject to a Lien under any Collateral Document held by any Grantor with respect to which, the cost, difficulty, burden or consequences (including adverse Tax consequences) of granting the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, a security interest therein and Lien thereupon, and pledging to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, thereof, to secure the Obligations (and any guaranty thereof) are excessive relative to the value to be afforded to Secured Parties thereby;

(vii) any rights under any Federal or state governmental license, permit, franchise or authorization to the extent that the granting of a security interest therein is specifically prohibited or restricted by any Requirements of Law;

(viii) any asset or property subject to a Permitted Lien to the extent the documents governing such Permitted Lien or the Permitted Indebtedness secured thereby prohibit other Liens on such assets or property;

(ix) Vehicles;

(x) any non-U.S. Intellectual Property;

(xi) Excluded Equity Interests;

(xii) any assets of any Foreign Subsidiary, CFC Holdco or any direct or indirect Subsidiary of a Foreign Subsidiary or CFC Holdco;

(xiii) Excluded Accounts (including, without limitation, [**]);

(xiv) any Trademarks or Copyrights of the term “Akebia”; and

(xv) Other Assets;

provided, however, that “Excluded Property” shall not include any proceeds, products, substitutions or replacements of Excluded Property (unless such proceeds, products, substitutions or replacements would otherwise constitute Excluded Property).

“Fraudulent Transfer Laws” has the meaning set forth in Section 2.2.

“Guaranteed Obligations” has the meaning set forth in Section 2.1.

“Guarantor” means each Grantor other than Borrower.

“Guaranty” means the guaranty of the Guaranteed Obligations made by Guarantors as set forth in this Agreement.

“IP License” means all express and implied grants or rights to make, have made, use, sell, reproduce, distribute, modify, or otherwise exploit any Intellectual Property, as well as all covenants not to sue and co-existence agreements (and all related IP Ancillary Rights), whether written or oral, relating to any Intellectual Property.

“Maximum Guaranteed Amount” has the meaning set forth in Section 2.2.

“NDA” means a new drug application filed with the FDA pursuant to Section 505(b) of the U.S. Federal Food, Drug, and Cosmetic Act, along with all supplements and amendments thereto.

“Other Assets” means, collectively, any and all United States Patents, Trademarks, Copyrights and other Intellectual Property and directly related rights owned or at any time hereafter acquired by Borrower or any of its Subsidiaries that, in each case is not required or necessary to own, license, develop, commercialize or otherwise fully exploit the market potential of the Product in the Territory, including, without limitation, [**] but excluding, for the avoidance of doubt, and not constituting “Other Assets” [**] (y) subject to the terms of the Loan Agreement with respect to the accounts described in Section 5.5 of the Loan Agreement, any proceeds, rents or profits of or in respect of any of the [**] which such proceeds, rents or profits shall, as promptly as reasonably practicable and solely as required under the Loan Agreement with respect to the accounts described in Section 5.5 of the Loan Agreement, be paid, remitted, transferred or otherwise deposited and held in Collateral Accounts subject to a Control Agreement or other appropriate instrument in favor of and for the benefit of Lenders and the other Secured Parties (in form and substance reasonably satisfactory to the Collateral Agent).

“Pledged Certificated Stock” means all of the Equity Interests (other than Excluded Equity Interests) of any Subsidiary evidenced by a certificate, instrument or other similar document (as defined in the Code), in each case owned by any Grantor, including a Grantor’s right, title and interest resulting from its ownership of any such Equity Interests as a limited or general partner in any partnership that has issued Pledged Certificated Stock or as a member of any limited liability company that has issued Pledged Certificated Stock, and a Grantor’s right, title and interest resulting from its ownership of any such Equity Interests in, to and under any Operating Document or shareholder agreement of any corporation, partnership or limited liability company to which it is a party, and any distribution of property made on, in respect of or in exchange for the foregoing from time to time, including all certificated Equity Interests listed on Schedule 1 of the Security Disclosure Letter. “Pledged Certificated Stock” includes, for the avoidance of doubt, any Pledged Uncertificated Stock that subsequently becomes certificated.

“Pledged Collateral” means, collectively, the Pledged Stock and the Pledged Debt Instruments.

“Pledged Debt Instruments” means all right, title and interest of any Grantor in instruments evidencing any Indebtedness owed to such Grantor or other obligations owed to such Grantor, and any distribution of property made on, in respect of or in exchange for the foregoing from time to time, including all Indebtedness described on Schedule 3 of the Security Disclosure Letter, issued by the obligors named therein. “Pledged Debt Instruments” excludes any Excluded Property.

“Pledged Investment Property” means any investment property of any Grantor, and any distribution of property made on, in respect of or in exchange for the foregoing from time to time, other than any Pledged Stock or Pledged Debt Instruments. “Pledged Investment Property” excludes any Excluded Property.

“Pledged Stock” means all Pledged Certificated Stock and all Pledged Uncertificated Stock.

“Pledged Uncertificated Stock” means all of the Equity Interests (other than Excluded Equity Interests) of any Subsidiary that is not Pledged Certificated Stock, in each case owned by any Grantor, including Grantor’s right, title and interest resulting from its ownership of any such Equity Interests as a limited or general partner in any partnership not constituting Pledged Certificated Stock or as a member of any limited liability company not constituting Pledged Certificated Stock, a Grantor’s right, title and interest resulting from its ownership of any such Equity Interests in, to and under any Operating Document or shareholder agreement of any partnership or limited liability company to which it is a party, and any distribution of property made on, in respect of or in exchange for the foregoing from time to time, including in each case those interests set forth on Schedule 1 of the Security Disclosure Letter, to the extent such interests are not certificated.

“Secured Obligations” has the meaning set forth in Section 3.2.

“Security Disclosure Letter” means the security agreement disclosure letter, dated as of the date hereof, delivered by the Grantors to the Collateral Agent and each Lender.

“Vehicles” means rolling stock, motor vehicles, vessels, aircraft and other assets subject to certificates of title.

Section 1.2. Certain Other Terms.

(a) For the purposes of and as used in this Agreement: (i) references to any Person include its successors and assigns and, in the case of any Governmental Authority, any Person succeeding to its functions and capacities; (ii) each authorization herein shall be deemed irrevocable and coupled with an interest; and (iii) where the context requires, provisions relating to any Collateral when used in relation to a Grantor shall refer to such Grantor’s Collateral or any relevant part thereof.

(b) Other Interpretive Provisions.

(i) Defined Terms. Unless otherwise specified herein or therein, all terms defined in this Agreement shall have the defined meanings when used in any certificate or other document made or delivered pursuant hereto.

(ii) This Agreement. The words “hereof”, “herein”, “hereunder” and words of similar import when used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement.

(iii) Certain Common Terms. The words “include”, “included” and “including” are not limiting and mean “including without limitation.” The word “or” has the inclusive meaning represented by the phrase “and/or”. The word “shall” is mandatory. The word “may” is permissive. The singular includes the plural and the plural includes the singular.

(iv) Performance; Time. Whenever any performance obligation hereunder (other than a payment obligation) shall be stated to be due or required to be satisfied on a day other than a Business Day, such performance shall be made or satisfied on the next succeeding Business Day. In the computation of periods of time from a specified date to a later specified date, the word “from” means “from and including”; the words “to” and “until” each mean “to but excluding”, and the word “through” means “to and including.” If any provision of this Agreement refers to any action taken or to be taken by any Person, or which such Person is prohibited from taking, such provision shall be interpreted to encompass any and all means, direct or indirect, of taking, or not taking, such action.

(v) Contracts. Except as the context otherwise requires (including to the extent otherwise expressly provided herein), references to any contract, agreement, instrument or other document, including this Agreement and the other Loan Documents, shall be deemed to include any and all amendments, supplements or modifications thereto or restatements or substitutions thereof, in each case which are in effect from time to time, but only to the extent such amendments, supplements, modifications, restatements or substitutions are not prohibited by the terms of any Loan Document.

(vi) Laws. Except as the context otherwise requires (including to the extent otherwise expressly provided herein), references to any law, statute, treaty, order, policy, rule or regulation include any amendments, supplements and successors thereto, and references to any law, statute, treaty, order, policy, rule or regulation are to be construed as including all statutory and regulatory provisions related thereto or consolidating, amending, replacing, supplementing or interpreting such law, statute, treaty, order, policy, rule or regulation.

(vii) Excluded Property. Notwithstanding anything to the contrary herein, the representations, warranties and covenants set forth herein in relation to the assets of the Grantors shall not apply to any Excluded Property.

ARTICLE II

GUARANTY

Section 2.1. Guaranty. To induce Lenders to make the Term Loans to Borrower in accordance with the terms and conditions of the Loan Agreement, each Guarantor, jointly and severally with each other Guarantor, absolutely, unconditionally and irrevocably guarantees, as primary obligor and not merely as surety, the full and punctual payment when due, whether at stated maturity or earlier, by reason of acceleration, mandatory prepayment or otherwise in accordance with any Loan Document, of all the Obligations of Borrower existing on the date hereof or hereinafter incurred or created (the “Guaranteed Obligations”). This Guaranty by each Guarantor hereunder constitutes a guaranty of payment and not of collection. Each Guarantor hereby acknowledges and agrees that the Guaranteed Obligations, at any time and from time to time, may exceed the Maximum Guaranteed Amount of such Guarantor and may exceed the aggregate of the Maximum Guaranteed Amounts of all Guarantors, in each case without discharging, limiting or otherwise affecting the obligations of any Guarantor hereunder or the rights, powers and remedies of any Secured Party hereunder or under any other Loan Document.

Section 2.2. Limitation of Guaranty. Any term or provision of this Guaranty or any other Loan Document to the contrary notwithstanding, the maximum aggregate amount for which any Guarantor shall be liable hereunder (the "Maximum Guaranteed Amount") shall not exceed the maximum amount for which such Guarantor can be liable without rendering this Guaranty or any other Loan Document, as it relates to such Guarantor, subject to avoidance under applicable Requirements of Law relating to fraudulent conveyance or fraudulent transfer (including the Uniform Fraudulent Conveyance Act, the Uniform Fraudulent Transfer Act and Section 548 of title 11 of the United States Code or any applicable provisions of comparable Requirements of Law) (collectively, "Fraudulent Transfer Laws"). Any analysis of the provisions of this Guaranty for purposes of Fraudulent Transfer Laws shall take into account the right of contribution established in Section 2.7 below and, for purposes of such analysis, give effect to any discharge of intercompany debt as a result of any payment made under the Guaranty.

Section 2.3. Authorization; Other Agreements. The Collateral Agent, on behalf of Lenders and the other Secured Parties is hereby authorized, without notice, to or demand upon any Guarantor and without discharging or otherwise affecting the obligations of any Guarantor hereunder and without incurring any liability hereunder, from time to time, to do each of the following but subject in all cases to the terms and conditions of the other Loan Documents:

(a) (i) modify, amend, supplement or otherwise change, (ii) accelerate or otherwise change the time of payment or (iii) waive or otherwise consent to noncompliance with, any Guaranteed Obligation or any Loan Document;

(b) apply to the Guaranteed Obligations any sums by whomever paid or however realized to any Guaranteed Obligation in such order as provided in the Loan Documents;

(c) refund at any time any payment received by any Secured Party in respect of any Guaranteed Obligation;

(d) (i) sell, exchange, enforce, waive, substitute, liquidate, terminate, release, abandon, fail to perfect, subordinate, accept, substitute, surrender, exchange, affect, impair or otherwise alter or release any Collateral for any Guaranteed Obligation or any other guaranty therefor in any manner, (ii) receive, take and hold additional Collateral to secure any Guaranteed Obligation, (iii) add, release or substitute any one or more other Guarantors, makers or endorser of any Guaranteed Obligation or any part thereof and (iv) otherwise deal in any manner with Borrower or any other Guarantor, maker or endorser of any Guaranteed Obligation or any part thereof; and

(e) settle, release, compromise, collect or otherwise liquidate the Guaranteed Obligations.

Section 2.4. Guaranty Absolute and Unconditional. Each Guarantor hereby waives and agrees not to assert any defense (other than the defense of payment in full of the Guaranteed Obligations (other than inchoate indemnity obligations)), whether arising in connection with or in respect of any of the following clauses (a) through (f) or otherwise, and hereby agrees that its obligations under this Guaranty are irrevocable, absolute and unconditional and shall not be discharged as a result of or otherwise affected by any of the following clauses (a) through (f) (which may not be pleaded and evidence of which may not be introduced in any proceeding with respect to this Guaranty, in each case except as otherwise agreed in writing by Lender):

(a) the invalidity or unenforceability of any obligation of Borrower or any other Guarantor under any Loan Document or any other agreement or instrument relating thereto (including any amendment, consent or waiver thereto), or any security for, or other guaranty of, any Guaranteed Obligation or any part thereof, or the lack of perfection or continuing perfection or failure of priority of any security for the Guaranteed Obligations or any part thereof;

(b) the absence of (i) any attempt to collect any Guaranteed Obligation or any part thereof from Borrower or any other Guarantor or other action to enforce the same or (ii) any action to enforce any Loan Document or any Lien thereunder;

(c) the failure by any Person to take any steps to perfect and maintain any Lien on, or to preserve any rights with respect to, any Collateral;

(d) any workout, insolvency, bankruptcy proceeding, reorganization, arrangement, liquidation or dissolution by or against Borrower, any other Guarantor or any of Borrower's other Subsidiaries or any procedure, agreement, order, stipulation, election, action or omission thereunder, including any discharge or disallowance of, or bar or stay against collecting, any Guaranteed Obligation (or any interest thereon) in or as a result of any such proceeding;

(e) any foreclosure, whether or not through judicial sale, and any other sale or other disposition of any Collateral or any election following the occurrence of an Event of Default and during the continuance thereof by the Collateral Agent, on behalf of Lenders and any other Secured Party, to proceed separately against any Collateral in accordance with the Collateral Agent's rights and the rights of any Lender or other Secured Party under any applicable Requirements of Law; or

(f) any other defense, setoff, counterclaim or any other circumstance that might otherwise constitute a legal or equitable discharge of Borrower, any other Guarantor or any other Subsidiary of Borrower, in each case other than the defense of payment in full of the Guaranteed Obligations (other than inchoate indemnity obligations).

Section 2.5. Waivers. To the fullest extent permitted by Requirements of Law, each Guarantor hereby unconditionally and irrevocably waives and agrees not to assert any claim, defense (other than the defense of payment in full of the Guaranteed Obligations (other than inchoate indemnity obligations)), setoff or counterclaim based on diligence, promptness, presentment, requirements for any demand or notice hereunder, including any of the following: (a) any demand for payment or performance and protest and notice of protest; (b) any notice of acceptance; (c) any presentment, demand, protest or further notice or other requirements of any kind with respect to any Guaranteed Obligation (including any accrued but unpaid interest thereon) becoming immediately due and payable; and (d) any other notice in respect of any Guaranteed Obligation or any part thereof, and any defense arising by reason of any disability or other defense of Borrower or any other Guarantor. Until the payment in full of the Guaranteed Obligations (other than inchoate indemnity obligations), each Guarantor further unconditionally and irrevocably agrees, to the fullest extent permitted by Requirements of Law, not to (x) enforce or otherwise exercise any right of subrogation or any right of reimbursement or contribution or similar right against Borrower or any other Guarantor by reason of any Loan Document or any payment made thereunder or (y) assert any claim, defense, setoff or counterclaim it may have against any other Credit Party or set off any of its obligations to such other Credit Party against obligations of such Credit Party to such Guarantor. No obligation of any Guarantor hereunder shall be discharged other than by complete performance.

Section 2.6. Reliance. Each Guarantor hereby assumes responsibility for keeping itself informed of the financial condition of Borrower, each other Guarantor and any other guarantor, maker or endorser of any Guaranteed Obligation or any part thereof, and of all other circumstances bearing upon the risk of nonpayment of any Guaranteed Obligation or any part thereof that reasonable and diligent inquiry would reveal, and each Guarantor hereby agrees that neither the Collateral Agent nor any Lender or other Secured Party shall have any duty to advise any Guarantor of information known to it regarding such condition or any such circumstances. In the event the Collateral Agent, in its sole discretion, undertakes at any time or from time to time to provide any such information to any Guarantor, such Person shall be under no obligation to (a) undertake any investigation not a part of its regular business routine, (b) disclose any information that any Lender or other Secured Party, pursuant to accepted or reasonable commercial finance or banking practices, wishes to maintain confidential or (c) make any future disclosures of such information or any other information to any Guarantor.

Section 2.7. Contribution. To the extent that any Guarantor shall be required hereunder to pay any portion of any Guaranteed Obligation exceeding the greater of (a) the amount of the value actually received by such Guarantor and its Subsidiaries from the Term Loans and other Obligations and (b) the amount such Guarantor would otherwise have paid if such Guarantor had paid the aggregate amount of the Guaranteed Obligations (excluding the amount thereof repaid by Borrower) in the same proportion as such Guarantor's net worth on the date enforcement is sought hereunder bears to the aggregate net worth of all Guarantors on such date, then such Guarantor shall be reimbursed by such other Guarantors for the amount of such excess, *pro rata*, based on the respective net worth of such other Guarantors on such date.

ARTICLE III

GRANT OF SECURITY INTEREST

Section 3.1. Collateral. For the purposes of this Agreement, the following tangible and intangible assets and property now owned or at any time hereafter acquired, developed or created by a Grantor or in which a Grantor now has or at any time in the future may acquire any right, title or interest, in each case, wherever located, is collectively referred to as the “Collateral”:

- (a) all agreements [**] to which a Grantor is a party and the rights of such Grantor thereunder relating to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the United States;
- (b) all of a Grantor’s right, title and interest in, to and under any NDA relating to the sale and marketing of the Product in the United States;
- (c) any and all United States Patents, Trademarks, Copyrights and other Intellectual Property and IP Licenses (including any IP Licenses under the Current Company IP Agreements to which a Grantor is a party and the rights of such Grantor thereunder, and all of a Grantor’s right, title and interest in, to and under any Internet Domain Names and Software) owned by a Grantor, in each case, relating to the research, development, manufacture, production, use, commercialization, marketing, importing, storage, transport, offer for sale, distribution or sale of the Product in the Territory;
- (d) all Pledged Stock;
- (e) any and all Collateral Accounts located in the United States;
- (f) all books, records, ledger cards, files, correspondence, customer lists, blueprints, technical specifications, manuals, computer software, computer printouts, tapes, disks and other electronic storage media and related data processing software and similar items that at any time pertain to or evidence or contain information specifically relating to any of the other property described in this Section 3.1;
- (g) all proceeds, products, accessions, rents and profits of or in respect of any of the foregoing; and
- (h) any proceeds, rents or profits of or in respect of any of the [**] (which such shall be paid, remitted, transferred or otherwise deposited and held in Collateral Accounts subject to a Control Agreement or other appropriate instrument in favor of and for the benefit of Lenders and the other Secured Parties (in form and substance reasonably satisfactory to the Collateral Agent);

in each case, excluding, however, all Excluded Property.

Section 3.2. Grant of Security Interest in Collateral. Without limiting any other security interest granted to the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, each Grantor, as collateral security for the prompt and complete payment and performance when due (whether at stated maturity, by acceleration or otherwise) of the Obligations of such Grantor (the “Secured Obligations”), hereby pledges, hypothecates and grants to the Collateral Agent, in favor and for the benefit of Lenders and the other Secured Parties, to secure the payment and performance in full of all of the Obligations for the benefit of Lenders and the other Secured Parties, a first priority Lien (subject only to Permitted Liens) on and continuing security interest in, all of its right, title and interest in, to and under the Collateral of such Grantor, wherever located, whether now owned or hereafter acquired or arising; provided, however, notwithstanding the foregoing, no Lien or security interest is hereby granted on, and “Collateral” shall not include, any Excluded Property.

ARTICLE IV

REPRESENTATIONS AND WARRANTIES

To induce the Collateral Agent and Lenders to enter into the Loan Documents, each Grantor, jointly and severally with each other Grantor, represents and warrants each of the following to the Collateral Agent, each Lender and the other Secured Parties as of the Closing Date:

Section 4.1. Title; No Other Liens. Except for the Lien granted to the Collateral Agent for the benefit of Lenders and the other Secured Parties pursuant to this Agreement and any other Permitted Liens under any Loan Document (including Section 4.2 hereof), such Grantor owns or otherwise has the rights it purports to have in each item of the Collateral, free and clear of any and all Liens or claims of others. Such Grantor (a) is the record and beneficial owner of the Collateral pledged by it hereunder constituting instruments or certificates and (b) except for Permitted Subsidiary Distribution Restrictions, has rights in or the power to transfer each other item of Collateral in which a Lien is granted by it hereunder, free and clear of any other Lien other than any Permitted Liens.

Section 4.2. Perfection and Priority. Other than in respect of money and other Collateral subject to Section 9-311(a)(1) of the Code, the security interest granted to the Collateral Agent pursuant to this Agreement constitutes a valid and continuing first priority security interest (subject, in the case of priority only, to Permitted Liens that are expressly permitted (if at all) by the terms of the Loan Agreement or this Agreement to, or that by operation of law, have superior priority to the Lien and security interest granted to the Collateral Agent for the benefit of Lenders and the other Secured Parties) in favor of and for the benefit of Lenders and the other Secured Parties in all Collateral, subject, for the following Collateral, to the occurrence of the following: (a) in the case of all Collateral in which a security interest may be perfected by filing a financing statement under the Code, the completion of the filings and other actions specified on Schedule 2 of the Security Disclosure Letter (which, in the case of all filings and other documents referred to on such schedule, have been duly authorized by the applicable Guarantor); (b) with respect to any account over which a Control Agreement is required pursuant to Section 5.5 of the Loan Agreement, the execution of Control Agreements; (c) in the case of all United States Trademarks, Patents and Copyrights for which Code filings are insufficient to effectuate perfection, all appropriate filings having been made with the Applicable IP Office, as applicable; (d) in the case of all Pledged Certificated Stock, Pledged Debt Instruments and Pledged Investment Property, the delivery thereof to the Collateral Agent, for the benefit of Lenders and the other Secured Parties, of such Pledged Certificated Stock, Pledged Debt Instruments and Pledged Investment Property consisting of instruments and certificates, in each case, properly endorsed for transfer to the Collateral Agent or in blank; (e) in the case of Pledged Uncertificated Stock, the delivery to the Collateral Agent, for the benefit of the Lenders and the other Secured Parties, of an executed uncertificated stock control agreement among the issuer, the registered owner and the Collateral Agent, in form and substance reasonably satisfactory to the Collateral Agent; and (f) in the case of all other instruments that are not Pledged Stock, if any, the delivery thereof to the Collateral Agent, for the benefit of Lenders and the other Secured Parties, of such instruments. Such Lien on and security interest in Pledged Stock shall be prior to all other Liens on such Collateral, subject to Permitted Liens having priority over the Collateral Agent's Lien by operation of law or as and to the extent expressly permitted (if at all) by any Loan Document. Except to the extent expressly not required pursuant to the terms of the Loan Agreement or this Agreement, all actions by each Grantor necessary to protect and perfect the Lien on and security interest in the Collateral granted hereunder have been duly taken.

Section 4.3. Pledged Stock.

(a) The Pledged Stock issued by any Subsidiary of any Grantor pledged by such Grantor hereunder (i) consist of the number and types of Equity Interests listed on Schedule 1 of the Security Disclosure Letter and constitutes that percentage of the issued and outstanding equity of all classes of each issuer thereof as set forth on Schedule 1 of the Security Disclosure Letter, (ii) has been duly authorized, validly issued and is fully paid and nonassessable (other than Pledged Stock in limited liability companies and partnerships), and (ii) constitutes the legal, valid and binding obligation of the obligor with respect thereto, enforceable in accordance with its terms. As of the date any Joinder Agreement or Pledge Amendment is delivered pursuant to Section 8.6, the Pledged Stock pledged by each applicable Grantor thereunder (x) is listed on the applicable schedule attached to such Joinder Agreement or Pledge Amendment, as applicable, and constitutes that percentage of the issued and outstanding equity of all classes of each issuer thereof as set forth on such schedule, (y) has been duly authorized, validly issued and is fully paid and non-assessable (other than Pledged Stock in limited liability companies and partnerships) and (z) constitutes the legal, valid and binding obligation of the obligor with respect thereto, enforceable in accordance with its terms.

(b) (i) All Pledged Certificated Stock has been delivered to the Collateral Agent, for the benefit of Lenders and the other Secured Parties, in accordance with Section 5.2(a), and (ii) with respect to Pledged Uncertificated Stock, uncertificated stock control agreements, in form and substance reasonably satisfactory to the Collateral Agent, have been delivered to the Collateral Agent, for the benefit of Lenders and the other Secured Parties, in accordance with Section 5.2(a).

(c) Upon the occurrence and during the continuance of an Event of Default, the Collateral Agent for the benefit of Lenders and the other Secured Parties shall be entitled to exercise all of the rights of the Grantor granting the security interest in any Pledged Stock, and a transferee or assignee of such Pledged Stock shall become a holder of such Pledged Stock to the same extent as such Grantor and, upon the transfer of the entire interest of such Grantor, such Grantor shall, by operation of law, cease to be a holder of such Pledged Stock.

ARTICLE V

COVENANTS

Each Grantor agrees with the Collateral Agent to the following, until the payment in full of the Obligations (other than inchoate indemnity obligations) and unless the Collateral Agent, on behalf of Lenders and the other Secured Parties, otherwise consents in writing:

Section 5.1. Maintenance of Perfected Security Interest; Further Documentation and Consents.

(a) Subject to the occurrence of the actions described in Section 4.2, which each Grantor shall promptly undertake, and except to the extent perfection is either (i) mutually agreed between Borrower and the Collateral Agent not to be required under this Agreement or the other Loan Documents or (ii) mutually agreed between Borrower and the Collateral Agent to be effected by filings of financing statements or amendments thereto to be made by the Collateral Agent or any Lender or its Related Party pursuant to Section 7.2, such Grantor shall maintain the security interest created by this Agreement as a perfected security interest having at least the priority described in Section 4.2 and shall warrant and defend the Collateral covered by such security interest and such priority against the claims and demands of all Persons (other than Secured Parties).

(b) Such Grantor shall furnish to the Collateral Agent at any time and from time to time statements and schedules further identifying and describing the Collateral and such other documents in connection with the Collateral as the Collateral Agent may reasonably request in writing, which requests shall be made no more frequently than once per calendar year or at any time or from time to time after the occurrence and during the continuance of an Event of Default, in all cases in reasonable detail and in form and substance reasonably satisfactory to the Collateral Agent.

(c) At any time and from time to time, upon the written request of the Collateral Agent, such Grantor shall, for the purpose of obtaining or preserving the full benefits of this Agreement and the other Collateral Documents and of the rights and powers herein and therein granted, (i) promptly and duly execute and deliver, and have recorded, such further documents, including an authorization to file (or, as applicable, the filing) of any financing statement or amendment under the Code (or other filings under similar Requirements of Law) in effect in any jurisdiction with respect to the security interest created hereby and (ii) take such further action as the Collateral Agent may reasonably request in writing that is consistent with the requirements hereof and of the other Loan Documents, including executing and delivering any Control Agreements required by Section 5.5 of the Loan Agreement with respect to the Collateral Accounts.

Section 5.2. Pledged Collateral.

(a) Delivery of Pledged Collateral. Such Grantor shall, promptly but in any event within [**] after acquiring any Pledged Collateral not owned on the Closing Date: (i) deliver to the Collateral Agent, in suitable form for transfer and in form and substance reasonably satisfactory to the Collateral Agent, (A) all such Pledged Stock that is Pledged Certificated Stock, (B) all Pledged Debt Instruments and (C) all certificates and instruments evidencing Pledged Investment Property; (ii) subject all Collateral Accounts required to be subject to a Control Agreement pursuant to the Loan Agreement to a Control Agreement; and (iii) cause the issuer of any such Pledged Stock with is Pledged Uncertificated Stock to execute an uncertificated stock control agreement among such issuer, such Grantor and the Collateral Agent, in form and substance reasonably satisfactory to the Collateral Agent, pursuant to which, *inter alia*, such issuer agrees to comply with the Collateral Agent's instructions with respect to such Pledged Uncertificated Stock without further consent by such Grantor and, for the avoidance of doubt, if any such Pledged Uncertificated Stock becomes certificated, within [**] thereof deliver to the Collateral Agent, in suitable form for transfer and in form and substance reasonably satisfactory to the Collateral Agent, all such certificates, instruments or other similar documents (as defined in the Code). Notwithstanding the foregoing, the Credit Parties (x) shall have until the date that is [**] following the Tranche A Closing Date to comply with the provisions of this Section 5.2(a) with regards to Pledged Certificated Stock of the Credit Parties in existence on the Tranche A Closing Date, and (y) shall have until the date that is [**] following the Tranche A Closing Date to comply with the provisions of this Section 5.2(a) with regards to Pledged Uncertificated Stock of the Credit Parties in existence on the Tranche A Closing Date.

(b) Event of Default. During the continuance of any Event of Default and in connection with the exercise of rights or remedies hereunder or under any other Loan Document, the Collateral Agent shall have the right, at any time in its discretion and without prior notice to Grantor, to (i) transfer to or to register in its name or in the name of its nominees any Pledged Stock and (ii) exchange any certificate or instrument representing or evidencing any Pledged Stock for certificates or instruments of smaller or larger denominations.

(c) Cash Distributions with respect to Pledged Collateral and Pledged Investment Property. Except as provided in Article VI and subject to any limitations set forth in the Loan Agreement, such Grantor shall be entitled to receive all cash distributions paid in respect of the Pledged Collateral and the Pledged Investment Property.

(d) Voting Rights. Except as provided in Article VI, such Grantor shall be entitled to exercise all voting, consent and corporate, partnership, limited liability company and similar rights with respect to the Pledged Collateral and Pledged Investment Property; provided, however, that no vote shall be cast, consent, waiver or ratification given or right exercised (or failed to be exercised) or other action taken (or failed to be taken) by such Grantor in any manner that would reasonably be expected to (i) violate or be inconsistent with any of the terms of this Agreement or any other Loan Document or (ii) have the effect of materially impairing such Collateral or the position or interests of the Secured Parties.

Section 5.3. Intellectual Property. Such Grantor shall, promptly (and in no event later than thirty (30) days) after delivery of financial statements pursuant to Section 5.2(a) of the Loan Agreement), execute and deliver to Lender in form and substance reasonably acceptable to Lender and suitable for filing in the Applicable IP Office the short-form intellectual property security agreements in the form attached hereto as Annex 3 for all Collateral consisting of any newly-acquired Copyrights, Trademarks or Patents (as applicable) of such Grantor registered in the Applicable IP Office during the applicable reporting period.

ARTICLE VI

REMEDIAL PROVISIONS

Section 6.1. Code and Other Remedies.

(a) Code Remedies. During the continuance of an Event of Default, the Collateral Agent, on behalf of Lenders and the other Secured Parties, may exercise, in addition to all other rights and remedies granted to it in this Agreement, any IP Agreement, any other Loan Document or in any other instrument or agreement securing, evidencing or relating to any Secured Obligation, all rights, powers and remedies of a secured party under the Code or any other Requirements of Law or in equity.

(b) Disposition of Collateral. During the continuance of an Event of Default, without limiting the generality of the foregoing, the Collateral Agent may (personally or through its agents or attorneys), without demand of performance or other demand, presentment, protest, advertisement or notice of any kind (except any notice required by Requirements of Law) to or upon any Grantor or any other Person (all and each of which demands, defenses, advertisements and notices are hereby waived): (i) enter upon the premises where any Collateral is located, without any obligation to pay rent, through self-help, without judicial process, without first obtaining a final judgment or giving Grantor or any other Person notice or opportunity for a hearing on the Collateral Agent's or any Lender's claim or action; (ii) collect, receive, appropriate and realize upon any Collateral; (iii) store, process, repair or recondition the Collateral or otherwise prepare any Collateral for disposition in any manner to the extent the Collateral Agent deems appropriate; and (iv) sell, assign, license out, convey, transfer, grant option or options to purchase or license and deliver any Collateral (or enter into contractual obligations to do any of the foregoing), in one or more parcels at public or private sale or sales, at any exchange, broker's board or office of the Collateral Agent or any Lender or other Secured Party or elsewhere upon such terms and conditions as it may deem advisable and at such prices as it may deem best, for cash or on credit or for future delivery without assumption of any credit risk. The Collateral Agent, on behalf of Lenders and the other Secured Parties, shall have the right, upon any such public sale or sales and, to the extent permitted by the Code and other Requirements of Law, upon any such private sale or sales, to purchase or license the whole or any part of the Collateral so sold or licensed, free of any right or equity of redemption of any Grantor, which right or equity is hereby waived and released. The Collateral Agent, as representative of all Lenders and other Secured Parties, shall be entitled, for the purpose of bidding and making settlement or payment of the purchase price for all or any portion of the Collateral sold at any such sale made in accordance with the Code, to use and apply any of the Secured Obligations as a credit on account of the purchase price for any Collateral payable by the Collateral Agent on behalf of Lenders and the other Secured Parties, at such sale. If the Collateral Agent on behalf of any Lender sells any of the Collateral upon credit, Grantor will be credited only with payments actually made by purchaser and received by such Lender and applied to indebtedness of the purchaser. In the event the purchaser fails to pay for the Collateral, the Collateral Agent may resell the Collateral and Grantor shall be credited with proceeds of the sale. Neither the Collateral Agent nor any Lender shall have an obligation to marshal any of the Collateral.

(c) Management of the Collateral. Each Grantor further agrees, that, during the continuance of any Event of Default, (i) at the Collateral Agent's request, it shall assemble the Collateral and make it available to the Collateral Agent at places that the Collateral Agent shall reasonably select, whether at such Grantor's premises or elsewhere, (ii) without limiting the foregoing, the Collateral Agent also has the right to require that such Grantor store and keep any Collateral pending further action by the Collateral Agent and, while any such Collateral is so stored or kept, provide such guards and maintenance services as shall be necessary to protect the same and to preserve and maintain such Collateral in good condition, normal wear and tear excepted, (iii) until the Collateral Agent is able to sell, assign, license out, convey or transfer any Collateral, the Collateral Agent shall have the right to hold or use such Collateral to the extent that it deems appropriate for the purpose of preserving the Collateral or its value or for any other purpose deemed appropriate by the Collateral Agent and (iv) the Collateral Agent may, if it so elects, seek the appointment of a receiver or keeper to take possession of any Collateral and to enforce any of the Collateral Agent's or any Lender's remedies, with respect to such appointment without prior notice or hearing as to such appointment. The Collateral Agent shall not have any obligation to any Grantor to maintain or preserve the rights of any Grantor as against other Persons with respect to any Collateral while such Collateral is in the possession of the Collateral Agent.

(d) Application of Proceeds. The Collateral Agent shall apply the cash proceeds received by it in respect of any sale of, any collection from, or other realization upon all or any part of the Collateral, after deducting all reasonable costs and expenses of every kind incurred in connection therewith or incidental to the care or safekeeping of any Collateral or in any way relating to the Collateral or the rights of Lenders and the other Secured Parties, including reasonable and documented out-of-pocket attorneys' fees and disbursements, to the payment in whole or in part of the Secured Obligations, as set forth in the Loan Agreement, and only after such application and after the payment by the Collateral Agent or Lenders of any other amount required by any Requirements of Law, need the Collateral Agent or any Lender account for the surplus, if any, to any Grantor.

(e) Direct Obligation. Neither the Collateral Agent nor any Lender or other Secured Party shall be required to make any demand upon, or pursue or exhaust any right or remedy against, any Grantor or any other Person with respect to the payment of the Obligations or to pursue or exhaust any right or remedy with respect to any Collateral therefor or any direct or indirect guaranty thereof. All of the rights and remedies of the Collateral Agent and Lenders and any other Secured Party shall be cumulative, may be exercised individually or concurrently and not exclusive of any other rights or remedies provided by any Requirements of Law. To the extent it may lawfully do so, each Grantor absolutely and irrevocably waives and relinquishes the benefit and advantage of, and covenants not to assert against the Collateral Agent, Lenders or any other Secured Party, any valuation, stay, appraisal, extension, redemption or similar laws and any and all rights or defenses it may have as a surety, now or hereafter existing, arising out of the exercise by any of them of any rights or remedies hereunder. If any notice of a proposed sale or other disposition of any Collateral shall be required by Requirements of Law, such notice shall be deemed reasonable and proper if given at least [**] before such sale or other disposition.

(f) Commercially Reasonable. To the extent that applicable Requirements of Law impose duties on the Collateral Agent or any Lender or other Secured Party to exercise remedies in a commercially reasonable manner, each Grantor acknowledges and agrees that it is not commercially unreasonable for the Collateral Agent or any Lender to do any of the following:

(i) fail to incur significant costs, expenses or other liabilities reasonably deemed as such by the Collateral Agent or such Lender to prepare any Collateral for disposition or otherwise to complete raw material or work in process into finished goods or other finished products for disposition;

(ii) fail to obtain permits, licenses or other consents for access to any Collateral to sell or license or for the collection or sale or licensing of any Collateral, or, if not required by other Requirements of Law, fail to obtain permits, licenses or other consents for the collection or disposition of any Collateral;

(iii) fail to exercise remedies against account debtors or other Persons obligated on any Collateral or to remove Liens on any Collateral or to remove any adverse claims against any Collateral;

(iv) advertise dispositions of any Collateral through publications or media of general circulation, whether or not such Collateral is of a specialized nature, or to contact other Persons, whether or not in the same business as any Grantor, for expressions of interest in acquiring any such Collateral;

(v) exercise collection remedies against account debtors and other Persons obligated on any Collateral, directly or through the use of collection agencies or other collection specialists, hire one or more professional auctioneers to assist in the disposition of any Collateral, whether or not such Collateral is of a specialized nature, or, to the extent deemed appropriate by the Collateral Agent or such Lender, obtain the services of other brokers, investment bankers, consultants and other professionals to assist the Collateral Agent or such Lender in the collection or disposition of any Collateral, or utilize Internet sites that provide for the auction of assets of the types included in the Collateral or that have the reasonable capacity of doing so, or that match buyers and sellers of assets to dispose of any Collateral;

(vi) dispose of assets in wholesale rather than retail markets;

(vii) disclaim warranties, such as title, merchantability, possession, non-infringement or quiet enjoyment; or

(viii) purchase insurance or credit enhancements to insure the Collateral Agent or any Lender or other Secured Party against risks of loss, collection or disposition of any Collateral or to provide to the Collateral Agent and Lenders a guaranteed return from the collection or disposition of any Collateral.

Each Grantor acknowledges that the purpose of this Section 6.1 is to provide a non-exhaustive list of actions or omissions that are commercially reasonable when exercising remedies against any Collateral and that other actions or omissions by the Collateral Agent, Lenders or any other Secured Party shall not be deemed commercially unreasonable solely on account of not being indicated in this Section 6.1. Without limitation upon the foregoing, nothing contained in this Section 6.1 shall be construed to grant any rights to any Grantor or to impose any duties on the Collateral Agent or any Lender or other Secured Party that would not have been granted or imposed by this Agreement or by applicable Requirements of Law in the absence of this Section 6.1.

(g) IP Licenses. To the extent permitted, and only for the purpose of enabling the Collateral Agent to exercise rights and remedies under this Section 6.1 during the continuance of an Event of Default (including in order to take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any Collateral) at such time as the Collateral Agent on behalf of Lenders and the other Secured Parties shall be lawfully entitled to exercise such rights and remedies, each Grantor hereby grants to the Collateral Agent (i) an irrevocable, nonexclusive, assignable, worldwide license (exercisable without payment of royalty or other compensation to such Grantor), including the right to sublicense, use and practice any and all Intellectual Property constituting Collateral now owned or held or hereafter acquired or held by such Grantor and access to all media in which any of the licensed items may be recorded or stored and to all Software and programs used for the compilation or printout thereof; provided that such license (A) shall not violate the express terms of any agreement between a Grantor and a third party governing the applicable Grantor's use of such Intellectual Property in effect on the date hereof and those granted by any Grantor hereafter, as expressly permitted under the Loan Documents, to the extent conflicting, (B) may be exercised, at the option of the Collateral Agent, only upon the occurrence and during the continuation of an Event of Default and (C) apply to the use of the Trademarks in connection with goods and services of similar type and quality to those heretofore sold by such Grantor under such Trademark and (ii) except to the extent, if any, expressly prohibited by any applicable contractual obligation, an irrevocable license (without payment of rent or other compensation to such Grantor) to use, operate and occupy all real property owned, operated, leased, subleased or otherwise occupied by such Grantor.

Section 6.2. Accounts and Payments in Respect of General Intangibles.

(a) In addition to, and not in substitution for, any similar requirement in the Loan Agreement, if required by the Collateral Agent at any time during the continuance of an Event of Default, any payment of accounts or payment in respect of general intangibles included in the Collateral, when collected by any Grantor, shall be promptly (and, in any event, within two (2) Business Days of such collection) deposited by such Grantor in the exact form received, duly indorsed by such Grantor to the Collateral Agent for the benefit of Lenders and the other Secured Parties, in a Collateral Account, subject to withdrawal by the Collateral Agent as provided in Section 6.4. Until so turned over, such payment shall be held by such Grantor in trust for the Collateral Agent for the benefit of Lenders and the other Secured Parties, segregated from other funds of such Grantor. Each such deposit of proceeds of accounts and payments in respect of general intangibles relating to the Collateral shall, upon the Collateral Agent's request, be accompanied by a report identifying in reasonable detail the nature and source of the payments included in the deposit.

(b) At any time during the continuance of an Event of Default, solely with respect to the Collateral:

(i) each Grantor shall, upon the Collateral Agent's request, assemble and hold for the benefit of Lenders and the other Secured Parties all original and other documents evidencing, and relating to, the contractual obligations and transactions that gave rise to any account or any payment in respect of general intangibles, including all IP Licenses, original orders, invoices and shipping receipts and notify account debtors that the accounts or general intangibles have been collaterally assigned to the Collateral Agent for the benefit of Lenders and the other Secured Parties and that payments in respect thereof shall be made directly to the Collateral Agent for the benefit of Lenders and the other Secured Parties or to any Lender on behalf of itself and the other Secured Parties, as the Collateral Agent shall direct; and

(ii) each Grantor shall take all actions, deliver all documents and provide all information necessary or reasonably requested by the Collateral Agent to ensure any Internet Domain Name is registered.

(c) Anything herein to the contrary notwithstanding, each Grantor shall remain liable under each account and each payment in respect of general intangibles included in the Collateral to observe and perform all the conditions and obligations to be observed and performed by it thereunder, all in accordance with the terms of any agreement giving rise thereto. Neither the Collateral Agent nor any Lender or other Secured Party shall have any obligation or liability under any agreement giving rise to an account or a payment in respect of a general intangible included in the Collateral by reason of or arising out of any Loan Document or the receipt by the Collateral Agent or any Lender or other Secured Party of any payment relating thereto, nor shall the Collateral Agent nor any Lender or other Secured Party be obligated in any manner to perform any obligation of any Grantor under or pursuant to any agreement giving rise to an account or a payment in respect of a general intangible included in the Collateral, to make any payment, to make any inquiry as to the nature or the sufficiency of any payment received by it or as to the sufficiency of any performance by any party thereunder, to present or file any claim, to take any action to enforce any performance or to collect the payment of any amounts that may have been assigned to it or to which it may be entitled at any time or times.

Section 6.3. Pledged Collateral.

(a) Voting Rights. During the continuance of an Event of Default, upon notice by the Collateral Agent to the relevant Grantor or Grantors, the Collateral Agent or its nominee may exercise such voting and other consensual rights, including (i) the right to exercise any voting, consent, corporate and other right pertaining to the Pledged Collateral at any meeting of shareholders, partners or members, as the case may be, of the relevant issuer or issuers of Pledged Collateral or otherwise, and (ii) any right of conversion, exchange and subscription and any other right, privilege or option pertaining to the Pledged Collateral as if it were the absolute owner thereof (including the right to exchange at its discretion any Pledged Collateral upon the merger, amalgamation, consolidation, reorganization, recapitalization or other fundamental change in the corporate or equivalent structure of any issuer of Pledged Collateral, the right to deposit and deliver any Pledged Collateral with any committee, depository, transfer agent, registrar or other designated agency upon such terms and conditions as the Collateral Agent (or such nominee) on behalf of Lenders or the other Secured Parties may determine), all without liability except to account for property actually received by it; provided, however, that the Collateral Agent (or such nominee) shall have no duty to any Grantor to exercise any such right, privilege or option and shall not be responsible for any failure to do so or delay in so doing.

(b) Proxies. During the continuance of an Event of Default, in order to permit the Collateral Agent on behalf of Lenders and the other Secured Parties to exercise the voting and other consensual rights that it may be entitled to exercise pursuant hereto and to receive all dividends and other distributions that it may be entitled to receive hereunder, (i) each Grantor shall promptly execute and deliver (or cause to be executed and delivered) to the Collateral Agent all such proxies, dividend payment orders and other instruments as the Collateral Agent may from time to time reasonably request and (ii) without limiting the effect of clause (i) above, such Grantor hereby grants to the Collateral Agent for the benefit of Lenders and the other Secured Parties an irrevocable proxy to vote all or any part of the Pledged Collateral and to exercise all other rights, powers, privileges and remedies to which a holder of the Pledged Collateral would be entitled (including giving or withholding written consents of shareholders, partners or members, as the case may be, calling special meetings of shareholders, partners or members, as the case may be, and voting at such meetings), which proxy shall be effective, automatically and without the necessity of any action (including any transfer of any Pledged Collateral on the record books of the issuer thereof) by any other Person (including the issuer of such Pledged Collateral or any officer or agent thereof) during the continuance of an Event of Default and which proxy shall only terminate upon (A) the cure of any and all Events of Default or (B) the payment in full of the Secured Obligations (other than contingent indemnification obligations to the extent no claim giving rise thereto has been asserted).

(c) Authorization of Issuers. Each Grantor hereby expressly and irrevocably authorizes and instructs, without any further instructions from such Grantor, each issuer of any Pledged Collateral pledged hereunder by such Grantor to, and each Grantor that is an issuer of Pledged Collateral so pledged hereunder hereby agrees to (i) comply with any instruction received by it from the Collateral Agent in writing that states that an Event of Default is continuing in accordance with the terms of this Agreement and each Grantor agrees that such issuer shall be fully protected from liabilities to such Grantor in so complying, and (ii) during the continuance of such Event of Default, unless otherwise permitted hereby or by the Loan Agreement, pay any dividend or make any other payment with respect to the Pledged Collateral directly to the Collateral Agent for the benefit of Lenders and the other Secured Parties or to any Lender on behalf of itself and the other Secured Parties, as the Collateral Agent shall direct.

Section 6.4. Proceeds to be Turned over to and Held by Collateral Agent. Unless otherwise expressly provided in the Loan Agreement, this Agreement or the other Loan Documents, during the continuance of an Event of Default and, upon written notice by the Collateral Agent to the relevant Grantor or Grantors, all proceeds of any Collateral received by any Grantor hereunder in cash or Cash Equivalents shall be held by such Grantor in trust for Lenders and the other Secured Parties, segregated from other funds of such Grantor, and shall, promptly upon receipt by any Grantor, be turned over to the Collateral Agent for the benefit of Lenders and the other Secured Parties in the exact form received (with any necessary endorsement). All such proceeds of Collateral and any other proceeds of any Collateral received by the Collateral Agent in cash or Cash Equivalents shall be held by the Collateral Agent for the benefit of itself and the other Secured Parties in a Collateral Account. All proceeds being held by the Collateral Agent in a Collateral Account (or by such Grantor in trust for Lenders and the other Secured Parties) shall continue to be held as collateral security for the Secured Obligations and shall not constitute payment thereof until applied as provided in the Loan Agreement.

Section 6.5. Sale of Pledged Collateral.

(a) Each Grantor recognizes that the Collateral Agent may be unable to effect a public sale of any Pledged Collateral by reason of certain prohibitions contained in the Securities Act and applicable state or foreign securities laws or otherwise or may determine that a public sale is impracticable, not desirable or not commercially reasonable and, accordingly, may resort to one or more private sales thereof to a restricted group of purchasers that shall be obliged to agree, among other things, to acquire such securities for their own account for investment and not with a view to the distribution or resale thereof. Each Grantor acknowledges and agrees that any such private sale may result in prices and other terms less favorable than if such sale were a public sale and, notwithstanding such circumstances, agrees that any such private sale shall be deemed to have been made in a commercially reasonable manner. The Collateral Agent shall be under no obligation to delay a sale of any Pledged Collateral for the period of time necessary to permit the issuer thereof to register such securities for public sale under the Securities Act or under applicable state securities laws even if such issuer would agree to do so.

(b) Each Grantor agrees to use commercially reasonable efforts to do or cause to be done all such other acts as may be reasonably necessary to make such sale or sales of any portion of the Pledged Collateral pursuant to Section 6.1 and this Section 6.5 valid and binding and in compliance with all applicable Requirements of Law. Each Grantor further agrees that a breach of any covenant contained herein will cause irreparable injury to the Collateral Agent, Lenders and the other Secured Parties, that the Collateral Agent, Lenders and the other Secured Parties have no adequate remedy at law in respect of such breach and, as a consequence, that each and every covenant contained herein shall be specifically enforceable against such Grantor, and such Grantor hereby waives and agrees not to assert any defense against an action for specific performance of such covenants except for a defense that no Event of Default has occurred and is continuing under the Loan Agreement or a defense of payment in full of the Guaranteed Obligations (other than inchoate indemnity obligations). Each Grantor waives any and all rights of contribution or subrogation upon the sale or disposition of all or any portion of the Pledged Collateral by the Collateral Agent on behalf of Lenders and the other Secured Parties.

Section 6.6. Deficiency. Each Grantor shall remain liable for any deficiency if the proceeds of any sale or other disposition of any Collateral are insufficient to pay the Secured Obligations and the reasonable and documented fees and disbursements of any attorney employed by the Collateral Agent or any Lender to collect such deficiency.

Section 6.7. Collateral Accounts. If any Event of Default shall have occurred and be continuing, the Collateral Agent may apply the balance from any Collateral Account of a Grantor or instruct the bank at which any Collateral Account is maintained to pay the balance of any Collateral Account to the Collateral Agent for the benefit of Lenders and the other Secured Parties or to any Lender on behalf of itself and the other Secured Parties, as the Collateral Agent shall direct, to be applied to the Secured Obligations in accordance with the terms hereof.

Section 6.8. Directions, Notices or Instructions. Neither the Collateral Agent nor any Lender or any Related Party thereof or any other Secured Party shall take any action under or issue any directions, notice or instructions pursuant to any Control Agreement or similar agreement unless an Event of Default has occurred and is continuing.

ARTICLE VII

ADDITIONAL RIGHTS OF COLLATERAL AGENT

Section 7.1. Collateral Agent's Appointment as Attorney-in-Fact.

(a) Each Grantor hereby irrevocably constitutes and appoints the Collateral Agent and any Related Party thereof, with full power of substitution, as its true and lawful attorney-in-fact with full irrevocable power and authority in the place and stead of such Grantor and in the name of such Grantor or in its own name, for the purpose of carrying out the terms of the Loan Documents, to take any appropriate action and to execute any document or instrument that may be necessary or desirable to accomplish the purposes of the Loan Documents, in each case during the continuance of an Event of Default, and, without limiting the generality of the foregoing, each Grantor hereby gives the Collateral Agent and its Related Party the power and right, on behalf of such Grantor, without notice to or assent by such Grantor, to do any of the following when an Event of Default shall be continuing:

(i) in the name of such Grantor, in its own name or otherwise, take possession of and indorse and collect any check, draft, note, acceptance or other instrument for the payment of moneys due under any account or general intangible or with respect to any other Collateral and file any claim or take any other action or proceeding in any court of law or equity or otherwise deemed appropriate by the Collateral Agent for the purpose of collecting any such moneys due under any account or general intangible or with respect to any other Collateral whenever payable;

(ii) in the case of any Intellectual Property (including any IP Ancillary Rights) or any IP Licenses included in the Collateral, execute, deliver and have recorded any document that the Collateral Agent may request to evidence, effect, publicize or record the Collateral Agent's security interest, in favor of and for the benefit of Lenders and the other Secured Parties, in such Intellectual Property or IP Licenses and the goodwill and general intangibles of such Grantor relating thereto or represented thereby and the Collateral Agent's (on behalf of Lenders and the other Secured Parties) rights and remedies with respect thereto;

(iii) pay or discharge taxes and Liens levied or placed on or threatened against any Collateral, effect any repair or obtain or pay any insurance called for by the terms of the Loan Agreement (including all or any part of the premiums therefor and the costs thereof);

(iv) execute, in connection with any sale provided for in Section 6.1 or 6.5, any document to effect or otherwise necessary or appropriate in relation to evidence the sale of any Collateral; or

(v) (A) direct any party liable for any payment under any Collateral to make payment of any moneys due or to become due thereunder directly to the Collateral Agent or as the Collateral Agent shall direct, (B) ask or demand for, and collect and receive payment of and receipt for, any moneys, claims and other amounts due or to become due at any time in respect of or arising out of any Collateral, (C) commence and prosecute any suit, action or proceeding at law or in equity in any court of competent jurisdiction to collect any Collateral and to enforce any other right in respect of any Collateral, (D) defend any actions, suits, proceedings, audits, claims, demands, orders or disputes brought against such Grantor with respect to any Collateral, (E) settle, compromise or adjust any such actions, suits, proceedings, audits, claims, demands, orders or disputes and, in connection therewith, give such discharges or releases as the Collateral Agent may deem appropriate, (F) assign or license any Intellectual Property included in the Collateral on such terms and conditions and in such manner as the Collateral Agent shall in its sole discretion determine, including the execution and filing of any document necessary to effectuate or record such assignment or license and (G) generally, sell, assign, license, convey, transfer or grant a Lien on, make any contractual obligation with respect to and otherwise deal with, any Collateral as fully and completely as though the Collateral Agent on behalf of Lenders and the other Secured Parties were the absolute owner thereof for all purposes and do, at the Collateral Agent's option, at any time or from time to time, all acts and things that the Collateral Agent deems necessary to protect, preserve or realize upon any Collateral and the Collateral Agent's, in favor of and for the benefit of Lenders and the other Secured Parties, security interests therein and to effect the intent of the Loan Documents, all as fully and effectively as such Grantor might do.

(vi) If any Grantor fails to perform or comply with any contractual obligation contained herein, the Collateral Agent, at its option, but without any obligation so to do, may perform or comply, or otherwise cause performance or compliance, with such contractual obligation.

(b) The Lender Expenses incurred in connection with actions undertaken as provided in this Section 7.1 shall be payable by such Grantor to such Person in accordance with Section 2.4 of the Loan Agreement.

(c) Each Grantor hereby ratifies all that said attorneys shall lawfully do or cause to be done by virtue of this Section 7.1. All powers, authorizations and agencies contained in this Agreement are coupled with an interest and are irrevocable until the payment in full of the Secured Obligations (other than inchoate indemnity obligations), this Agreement is terminated and the security interests created hereby are released.

Section 7.2. Authorization to File Financing Statements. Each Grantor authorizes the Collateral Agent and its Related Party, at any time and from time to time, without notice to any Grantor, to file or record financing statements, amendments thereto, and other filing or recording documents or instruments with respect to any Collateral in such form, in such jurisdictions and in such offices as the Collateral Agent reasonably determines appropriate to perfect or protect the security interests of the Collateral Agent, in favor of and for the benefit of Lenders and the other Secured Parties, under this Agreement or any other Loan Document (and the Collateral Agent's and each Lender's and each other Secured Party's rights in respect thereof). A photographic or other reproduction of this Agreement shall be sufficient as a financing statement or other filing or recording document or instrument for filing or recording in any jurisdiction. Such Grantor also hereby ratifies its authorization for the Collateral Agent to have filed any initial financing statement or amendment thereto under the Code (or other similar laws) in effect in any jurisdiction if filed prior to the date hereof.

Section 7.3. Authority of Collateral Agent. Each Grantor acknowledges that, as between the Collateral Agent and the Grantors, the Collateral Agent shall be conclusively presumed to be acting as agent for each Lender and all of the other Secured Parties with full and valid authority so to act or refrain from acting, and no Grantor shall be under any obligation or entitlement to make any inquiry respecting such authority.

Section 7.4. Duty; Obligations and Liabilities.

(a) **Duty of Collateral Agent.** The Collateral Agent's sole duty with respect to the custody, safekeeping and physical preservation of the Collateral in its possession shall be to deal with it in the same manner as it deals with similar property for its own account. The powers conferred on the Collateral Agent hereunder are solely to protect each Lender's and the other Secured Parties' interest in the Collateral and shall not impose any duty upon the Collateral Agent to exercise any such powers. The Collateral Agent shall be accountable only for amounts that it receives as a result of the exercise of such powers, and neither it nor any of its Related Parties shall be responsible to any Grantor for any act or failure to act hereunder, except for its or their own gross negligence, bad faith or willful misconduct as finally determined by a court of competent jurisdiction. In addition, the Collateral Agent shall not be liable or responsible for any loss or damage to any Collateral, or for any diminution in the value thereof, by reason of the act or omission of any warehousemen, carrier, forwarding agency, consignee or other bailee if such Person has been selected by the Collateral Agent in good faith.

(b) **Obligations and Liabilities with respect to Collateral.** Neither the Collateral Agent nor Lenders or any other Secured Parties nor any of their respective Related Parties shall be liable for failure to demand, collect or realize upon any Collateral or for any delay in doing so or shall be under any obligation to sell or otherwise dispose of any Collateral upon the request of any Grantor or any other Person or to take any other action whatsoever with regard to any Collateral.

ARTICLE VIII

MISCELLANEOUS

Section 8.1. Reinstatement. Each Grantor agrees that, if any payment made by any Credit Party or other Person and applied to the Secured Obligations is at any time annulled, avoided, set aside, rescinded, invalidated, declared to be fraudulent or preferential or otherwise required to be refunded or repaid, or the proceeds of any Collateral are required to be returned by any Secured Party to such Credit Party, its estate, trustee, receiver or any other party, including any Grantor, under any bankruptcy law, state or federal law, common law or equitable cause, then, to the extent of such payment or repayment, any Lien or other Collateral securing such liability shall be and remain in full force and effect, as fully as if such payment had never been made. If, prior to any of the foregoing, (a) any Lien or other Collateral securing such Grantor's liability hereunder shall have been released or terminated by virtue of the foregoing or (b) any provision of the Guaranty hereunder shall have been terminated, cancelled or surrendered, such Lien, other Collateral or provision shall be reinstated in full force and effect and such prior release, termination, cancellation or surrender shall not diminish, release, discharge, impair or otherwise affect the obligations of such Grantor in respect of any Lien or other Collateral securing such obligation or the amount of such payment.

Section 8.2. Release of Collateral and Guarantee Obligations.

(a) When all Obligations (other than unasserted inchoate indemnity obligations) have been paid in full, the Collateral shall be released from the Lien created hereby and this Agreement and all obligations (other than those expressly stated to survive such termination) of each Lender and any other Secured Party and each Guarantor and Grantor hereunder shall terminate, all without delivery of any instrument or performance of any act by any party (except as required hereunder), and all rights of the Collateral Agent, Lenders and any other Secured Parties to the Collateral shall revert to the Grantors.

(b) In connection with any termination or release pursuant to this Section 8.2, the Collateral Agent shall, and to the extent required, each Secured Party hereby authorizes the Collateral Agent to, promptly execute and deliver to any Grantor all instruments, documents and agreements which such Grantor shall reasonably request in writing to evidence and confirm such termination or release (including termination statements under the Code), and will duly assign, transfer and deliver to such Grantor (or its designee), such of the Collateral that may be in the possession of the Collateral Agent, all without further consent or joinder of the Collateral Agent or any Lender or other Secured Party.

(c) Any termination or release pursuant to this Section 8.2 is subject to reinstatement as provided in Section 8.1.

(d) Upon the release of the Liens on any Collateral or of a Grantor from all of its obligations as a Credit Party under the Loan Agreement and as a Grantor hereunder, any representation, warranty or covenant contained in any Loan Document relating to any such Collateral or such Grantor, as applicable, shall no longer be deemed to be made.

(e) Borrower agrees to pay all Lender Expenses incurred by the Collateral Agent and each Lender and other Secured Party in connection with the taking of any actions pursuant to or as otherwise contemplated by this Section 8.2 in accordance with Section 2.4 of the Loan Agreement.

Section 8.3. Independent Obligations. The obligations of each Grantor hereunder are independent of and separate from the Secured Obligations and the Guaranteed Obligations. Upon any Event of Default and during the continuance thereof, the Collateral Agent for the benefit of Lenders and the other Secured Parties may, at its sole election, proceed directly and at once, without notice, against any Grantor and any Collateral to collect and recover the full amount of any Secured Obligation or Guaranteed Obligation then due, without first proceeding against any other Grantor, any other Credit Party or any other Collateral and without first joining any other Grantor or any other Credit Party in any proceeding.

Section 8.4. No Waiver by Course of Conduct. Neither the Collateral Agent nor any Secured Party shall by any act (except by a written instrument pursuant to Section 8.5), delay, indulgence, omission or otherwise be deemed to have waived any right or remedy hereunder or to have acquiesced in any Default or Event of Default. No failure to exercise, nor any delay in exercising, on the part of the Collateral Agent or any Secured Party, any right, power or privilege hereunder shall operate as a waiver thereof. No single or partial exercise of any right, power or privilege hereunder shall preclude any other or further exercise thereof or the exercise of any other right, power or privilege. A waiver by the Collateral Agent or any Secured Party of any right or remedy hereunder on any one occasion shall not be construed as a bar to any right or remedy that the Collateral Agent or any Secured Party would otherwise have on any future occasion.

Section 8.5. Amendments in Writing. None of the terms or provisions of this Agreement may be waived, amended, supplemented or otherwise modified except in accordance with Section 11.5 of the Loan Agreement; provided, however, that annexes to this Agreement may be supplemented (but no existing provisions may be modified and no Collateral may be released) through Pledge Amendments and Joinder Agreements, in substantially the form of Annex 1 and Annex 2 attached hereto, respectively, in each case, duly executed by the Collateral Agent and each Grantor directly affected thereby.

Section 8.6. Additional Grantors and Guarantors; Additional Pledged Collateral.

(a) Joinder Agreements. If, at the option of Borrower or as required pursuant to Section 5.12 or Section 5.13 of the Loan Agreement, Borrower shall cause any Subsidiary (other than an Excluded Subsidiary) that is not a Grantor or Guarantor to become a Grantor and Guarantor hereunder, such Subsidiary shall execute and deliver to the Collateral Agent a Joinder Agreement substantially in the form of Annex 2 attached hereto and shall thereafter for all purposes be a party hereto and have the same rights, benefits and obligations as a Grantor party hereto on the Closing Date.

(b) Pledge Amendments. To the extent any Pledged Collateral has not been delivered as of the Closing Date, such Grantor shall, promptly after such Pledged Collateral is acquired, deliver a pledge amendment duly executed by the Grantor in substantially the form of Annex 1 attached hereto (each, a "Pledge Amendment"). Such Grantor authorizes the Collateral Agent to attach each Pledge Amendment to this Agreement.

Section 8.7. Notices. All notices, requests and demands to or upon the Collateral Agent or any Grantor hereunder shall be effected in the manner provided for in Section 9 of the Loan Agreement; provided, however, that any such notice, request or demand to or upon any Grantor shall be addressed to Borrower's notice address set forth in Section 9 of the Loan Agreement.

Section 8.8. Successors and Assigns. This Agreement shall be binding upon the successors and assigns of each Grantor and shall inure to the benefit of the Collateral Agent and each Secured Party and their respective successors and assigns; provided, however, that no Grantor may assign, transfer or delegate any of its rights or obligations under this Agreement without the prior written consent of the Collateral Agent.

Section 8.9. Counterparts. This Agreement may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement. Signature pages may be detached from multiple separate counterparts and attached to a single counterpart. Delivery of an executed signature page of this Agreement by facsimile transmission or by electronic transmission shall be as effective as delivery of a manually executed counterpart hereof.

Section 8.10. Severability. Any provision of this Agreement being held illegal, invalid or unenforceable in any jurisdiction shall not affect any part of such provision not held illegal, invalid or unenforceable, any other provision of this Agreement or any part of such provision in any other jurisdiction.

Section 8.11. Governing Law. This Agreement and the rights and obligations of the parties hereto shall be governed by, and construed and interpreted in accordance with, the law of the State of New York without regard to any principle of conflicts of law that could require the application of the law of any other jurisdiction.

Section 8.12. Waiver of Jury Trial. TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EACH PARTY HERETO HEREBY IRREVOCABLY WAIVES TRIAL BY JURY IN ANY SUIT, ACTION OR PROCEEDING WITH RESPECT TO, OR DIRECTLY OR INDIRECTLY ARISING OUT OF, UNDER OR IN CONNECTION WITH, THIS AGREEMENT, ANY OTHER LOAN DOCUMENT OR THE TRANSACTIONS CONTEMPLATED HEREIN AND THEREIN OR RELATED HERETO OR THERETO (WHETHER FOUNDED IN CONTRACT, TORT OR ANY OTHER THEORY). EACH PARTY HERETO (A) CERTIFIES THAT NO OTHER PARTY AND NO RELATED PARTY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) ACKNOWLEDGES THAT IT AND THE OTHER PARTIES HERETO HAVE BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION 8.12 AND (C) HAS REVIEWED THIS WAIVER WITH ITS COUNSEL.

Section 8.13. EACH PARTY HERETO AGREES TO BE BOUND BY THE PROVISIONS OF SECTION 10 OF THE LOAN AGREEMENT.

[Signature Pages Follow]

IN WITNESS WHEREOF, each of the undersigned has caused this Guaranty and Security Agreement to be duly executed and delivered as of the date first above written.

AKEBIA THERAPEUTICS, INC.,
as Borrower and Grantor

By /s/ Jason A. Amello
Name: Jason A. Amello
Title: Senior Vice President, Chief Financial Officer and Treasurer

KERYX BIOPHARMACEUTICALS, INC.,
as a Grantor

By /s/ Jason A. Amello
Name: Jason A. Amello
Title: Chief Financial Officer

Signature Page to Guaranty and Security Agreement

ACCEPTED AND AGREED
as of the date first above written:

BIOPHARMA CREDIT PLC,
as Collateral Agent

By: Pharmakon Advisors, LP,
its Investment Manager

By: Pharmakon Management I, LLC,
its General Partner

By /s/ Pedro Gonzalez de Cosio
Name: Pedro Gonzalez de Cosio
Title: Managing Member

Signature Page to Guaranty and Security Agreement

SUBSIDIARIES OF THE REGISTRANT

Name	Jurisdiction of Organization
Akebia Therapeutics Securities Corporation	Massachusetts
Akebia Europe Limited	Ireland
Keryx Biopharmaceuticals, Inc.	Delaware
ACCESS Oncology, Inc.	Delaware
AOI Pharma, Inc.	Delaware
AOI Pharmaceuticals, Inc.	Delaware
Online Collaborative Oncology Group, Inc.	Delaware
Accumin Diagnostics, Inc.	Delaware
Neryx Biopharmaceuticals, Inc.	Delaware
Keryx Biopharma UK Ltd.	United Kingdom
Keryx Israel, Ltd.	Israel
Keryx Biomedical Technologies, Ltd.	Israel

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

- (1) Registration Statement (Form S-3 No. 333-223585) of Akebia Therapeutics, Inc.,
- (2) Registration Statement (Form S-8 No. 333-196748) pertaining to the Amended and Restated 2008 Equity Incentive Plan, the 2014 Incentive Plan, and the 2014 Employee Stock Purchase Plan of Akebia Therapeutics, Inc.,
- (3) Registration Statement (Form S-8 No. 333-209469) pertaining to the 2014 Incentive Plan and the 2014 Employee Stock Purchase Plan of Akebia Therapeutics, Inc.,
- (4) Registration Statement (Form S-8 No. 333-216475) pertaining to the 2014 Incentive Plan and the 2016 Inducement Award Program of Akebia Therapeutics, Inc.,
- (5) Registration Statement (Form S-8 No. 333-222728) pertaining to the 2014 Incentive Plan and the 2016 Inducement Award Program of Akebia Therapeutics, Inc.,
- (6) Registration Statement (Form S-4 No. 333-227622) of Akebia Therapeutics, Inc.,
- (7) Registration Statement (Form S-8 No. 333-228772) pertaining to the 2014 Incentive Plan of Akebia Therapeutics, Inc. and the 1999 Share Option Plan, 2004 Long-Term Incentive Plan, 2007 Incentive Plan, Amended and Restated 2013 Incentive Plan, and 2018 Equity Incentive Plan of Keryx Biopharmaceuticals, Inc., and
- (8) Registration Statement (Form S-8 No. 333-229366) pertaining to the 2014 Incentive Plan, the 2014 Employee Stock Purchase Plan, and the Inducement Grants (January 2018 – December 2018) of Akebia Therapeutics, Inc.
- (9) Registration Statement (Form S-8 No. 333-229366) pertaining to the 2014 Incentive Plan, the 2014 Employee Stock Purchase Plan, and the Inducement Grants (January 2018 – December 2018) of Akebia Therapeutics, Inc.,
- (10) Registration Statement (Form S-8 No. 333-233140) pertaining to the amended and restated 2014 Employee Stock Purchase Plan of Akebia Therapeutics, Inc.,
- (11) Registration Statement (Form S-8 No. 333-236060) pertaining to the 2014 Incentive Plan and the Inducement Grant Awards (January 2019 – December 2019) of Akebia Therapeutics, Inc.,

of our reports dated March 12, 2020, with respect to the consolidated financial statements of Akebia Therapeutics, Inc. and the effectiveness of internal control over financial reporting of Akebia Therapeutics, Inc. included in this Annual Report (Form 10-K) of Akebia Therapeutics, Inc. for the year ended December 31, 2019.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 12, 2020

CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, John P. Butler, certify that:

1. I have reviewed this Annual Report on Form 10-K of Akebia Therapeutics, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the Audit Committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 12, 2020

By: /s/ John P. Butler

John P. Butler
President, Chief Executive Officer and Director
(Principal Executive Officer)

CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Jason A. Amello, certify that:

1. I have reviewed this Annual Report on Form 10-K of Akebia Therapeutics, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the Audit Committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 12, 2020

By: /s/ Jason A. Amello

Jason A. Amello
Senior Vice President, Chief Financial Officer and Treasurer
(Principal Financial Officer)

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002 (18 U.S.C. Section 1350)

In connection with the accompanying Annual Report of Akebia Therapeutics, Inc. (the Company) on Form 10-K for the fiscal year ended December 31, 2019 (the Report), I, John P. Butler, as Chief Executive Officer and President of the Company, and I, Jason A. Amello, as Senior Vice President, Chief Financial Officer and Treasurer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 12, 2020

By: /s/ John P. Butler
John P. Butler
President, Chief Executive Officer and Director
(Principal Executive Officer)

Date: March 12, 2020

By: /s/ Jason A. Amello
Jason A. Amello
Senior Vice President, Chief Financial Officer
and Treasurer
(Principal Financial Officer)