CONCERT PHARMACEUTICALS, INC.

FORM 10-K
(Annual Report)

Filed 03/06/17 for the Period Ending 12/31/16

Address	99 HAYDEN AVENUE SUITE 500 LEXINGTON, MA 02421
Telephone	781-860-0045
CIK	0001367920
Symbol	CNCE
SIC Code	2834 - Pharmaceutical Preparations
Industry	Biotechnology & Medical Research
Sector	Healthcare
Fiscal Year	12/31

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, 2016

or

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

For the transition period from __________ to __________

Commission file number: 001-36310

CONCERT PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**20-4839882**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

99 Hayden Avenue, Suite 500
Lexington, Massachusetts 02421
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: (781) 860-0045

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

Title of each class	Name of each exchange on which registered
Common Stock, par value $0.001 per share	**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 Section 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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

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

Large accelerated filer	☐		Accelerated filer	☒
Non-accelerated filer	☐	(Do not check if a smaller reporting company)	Smaller reporting company	☐

Indicate by check mark whether the 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 as of June 30, 2016 was approximately $135,211,000, based on the closing price of the registrant's common stock on the NASDAQ Global Market on that date.

The number of shares outstanding of the registrant's Common Stock as of February 27, 2017: 22,328,982

CONCERT PHARMACEUTICALS, INC.
TABLE OF CONTENTS

References to Concert

Throughout this Annual Report on Form 10-K, the "Company," "Concert," "we," "us," and "our," except where the context requires otherwise, refer to Concert Pharmaceuticals, Inc. and its consolidated subsidiary, and "our board of directors" refers to the board of directors of Concert Pharmaceuticals, Inc.

Forward-Looking Information

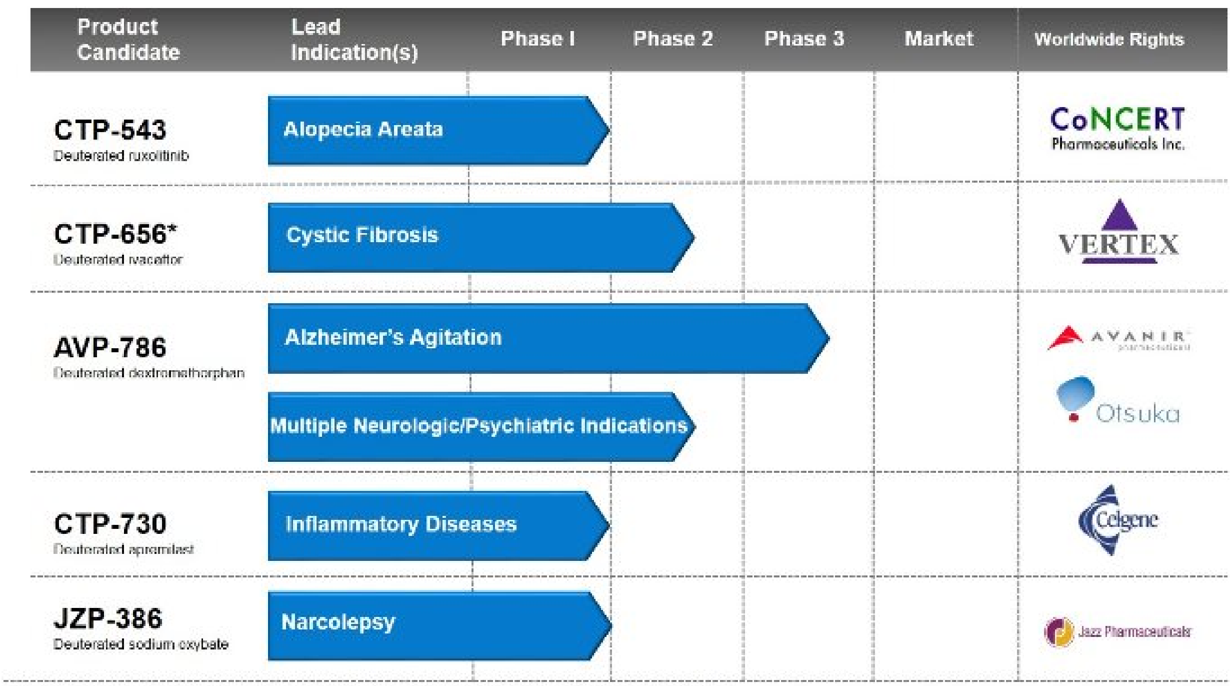
This Annual Report on Form 10-K contains forward-looking statements regarding, among other things, our future discovery and development efforts, our future operating results and financial position, our business strategy, and other objectives for our operations. The words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "predict," "project," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. You also can identify forward-looking statements by the fact that they do not relate strictly to historical or current facts. There are a number of important risks and uncertainties that could cause our actual results to differ materially from those indicated by forward-looking statements. These risks and uncertainties include those inherent in pharmaceutical research and development, such as adverse results in our drug discovery and clinical development activities, decisions made by the U.S. Food and Drug Administration and other regulatory authorities with respect to the development and commercialization of our drug candidates, our ability to obtain, maintain and enforce intellectual property rights for our drug candidates, our ability to obtain any necessary financing to conduct our planned activities and other risk factors. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this Annual Report on Form 10-K, particularly in the section entitled "Risk Factors" in Part I that could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments that we may make. Unless required by law, we do not undertake any obligation to publicly update any forward-looking statements.

Part I

Item 1. Business

OVERVIEW

We are a clinical stage biopharmaceutical company applying our extensive knowledge of deuterium chemistry to discover and develop novel small molecule drugs. Selective incorporation of deuterium into known molecules has the potential, on a case-by-case basis, to provide better pharmacokinetic or metabolic properties, thereby enhancing their clinical safety, tolerability or efficacy. Our approach typically starts with approved drugs that may be improved with deuterium substitution. Our technology provides the opportunity to develop products that may compete with the non-deuterated drug in existing markets or to leverage the known activity of approved drugs to expand into new indications. Our deuterated chemical entity platform, or DCE Platform®, has broad potential across numerous therapeutic areas. The following table summarizes our clinical pipeline of product candidates. All of these candidates are small molecules being developed for oral administration.



*Subject to closing of the CTP-656 Asset Purchase Agreement with Vertex Pharmaceuticals

OUR STRATEGY

Our strategy is to apply our deuterium technology to well characterized molecules in order to leverage their known safety and efficacy profiles. We select pipeline candidates based on the medical needs of patients, commercial opportunity, regulatory considerations, and competitive landscape.

Our approach aims to enable drug discovery and clinical development that is more efficient and less expensive than conventional small molecule drug research and development. Key elements of our strategy include:

- using deuterium technology to develop deuterated product candidates with substantially improved safety, tolerability or efficacy profiles to compete directly with the non-deuterated compound in its approved indication and develop deuterated product candidates that are based on approved drugs but for new indications that we believe are promising in view of the known biology of the approved drug;

- developing our deuterated product candidates quickly through proof-of-concept clinical trials, which could be as early as Phase 1, and then determining whether to advance it independently or with a partner; and

- commercializing product candidates on our own, or with a strategic partner.

DEUTERIUM

Due to its natural abundance, the average adult human body contains approximately two grams of deuterium. While essentially identical to hydrogen in size and shape, deuterium differs from hydrogen in that it contains an additional neutron. As a result, deuterium forms a more stable chemical bond with carbon than does hydrogen. The deuterium-carbon bond is typically six to nine times more stable than the hydrogen-carbon bond. This has important implications for drug development because drug metabolism often involves the breaking of hydrogen-carbon bonds.

Because deuterium forms more stable bonds with carbon, deuterium substitution can in some cases alter drug metabolism, including through improved metabolic stability, reduced formation of toxic metabolites, increased formation of desired active metabolites, or a combination of these effects. At the same time, because deuterium closely resembles hydrogen, the substitution of deuterium for hydrogen has generally been found not to materially alter the intrinsic biological activity of a compound. Deuterated compounds can generally be expected to retain biochemical potency and selectivity similar to their hydrogen analogs. The effects, if any, of deuterium substitution on metabolic properties are highly dependent on the specific molecular positions at which deuterium is substituted for hydrogen. In addition, the metabolic effects of deuterium substitution, if any, are unpredictable, even in compounds that have similar chemical structures.

Potential advantages of product candidates based on our DCE Platform

Using our DCE Platform, we create novel drugs designed to have superior properties - including enhanced clinical safety, tolerability or efficacy - based on compounds that have established pharmacological activity. In many instances, Phase 1 clinical evaluation has the potential to demonstrate whether there will be product differentiation.
Potential advantages of our DCE Platform include the following:

- *Improved metabolic profile.* An improved metabolic profile may potentially reduce or eliminate unwanted side effects or undesirable drug interactions or increase efficacy. Metabolic profile refers to the relative amounts and exposure profile of the parent drug and its metabolites in the body.

- *Increased half-life.* A longer half-life may decrease the number of doses that a patient is required to take per day or provide more consistent exposure of the compound in comparison to the corresponding non-deuterated compound, potentially improving the drug's therapeutic profile. Half-life is usually defined as the time it takes for the body to clear half of a given concentration of the drug from the plasma.

- *Avoidance of undesirable metabolism:* By avoiding first pass metabolism, we may be able to improve oral bioavailability, which could potentially lead to better efficacy at a lower dose of drug. First pass metabolism is metabolism that occurs before the drug reaches the circulatory system.

OUR PRODUCT CANDIDATES

Our pipeline is focused on leveraging our deuterium expertise and proprietary product platform to develop novel medications designed to enhance patient outcomes in diverse therapeutic areas including pulmonary diseases, including cystic fibrosis, autoimmune and inflammatory diseases, and central nervous systems (CNS) disorders. The discussion below highlights our current clinical programs including those being developed by our collaborators.

CTP-656

Background on Cystic Fibrosis

Cystic fibrosis is a rare, life-threatening genetic disease affecting approximately 70,000 people worldwide. There is no known cure for cystic fibrosis. The median predicted survival age is close to 40 years and nearly half of the cystic fibrosis population is 18 or older. Cystic fibrosis is caused by mutations in the gene that encodes the cystic fibrosis transmembrane conductance regulator protein, or CFTR, a chloride channel that regulates the movement of salt and water into and out of cells. Children who develop cystic fibrosis inherit two defective CFTR genes, one from each parent, which are referred to as alleles. There are more than 1,900 known mutations in the CFTR gene, some of which result in cystic fibrosis, including the most prevalent F508del mutation and the less prevalent G551D gating mutation. In the United States, it is estimated that approximately 85% of individuals with cystic fibrosis have at least one F508del mutation and approximately 4.4% of people with cystic fibrosis have a G551D gating mutation. Each mutation causes a different defect in the CFTR protein. When there is a defect caused by the G551D gating mutation, the defective CFTR protein reaches the surface of a cell but does not efficiently transport chloride ions across the cell membrane. The F508del mutation results in a different defect that largely prevents the CFTR protein from reaching the cell surface and also impairs its ability to transport chloride ions.

Defective CFTR results in decreased chloride secretion and reduced hydration of the mucus layer leading to the buildup of thick mucus in the lungs and other vital organs. Lung disease, the most critical manifestation of cystic fibrosis, is characterized by airway obstruction, infection and inflammation, such that more than 90% of all cystic fibrosis patients die of lung disease. Cystic fibrosis patients typically require lifelong treatment, with multiple daily medications, in many cases hospitalization due to lung infections, and potentially lung transplantation.

Ivacaftor (Kalydeco®) is a drug marketed by Vertex Pharmaceuticals, Inc., or Vertex, and initially approved for patients with the G551D gating mutation. The label has been expanded to include patients with certain other mutations. Ivacaftor is a CFTR potentiator, which keeps the CFTR protein channels on the cell surface open more often, to increase the flow of salt and water into and out of the cell. Vertex has also incorporated ivacaftor into the fixed dose combination drug, Orkambi®, which is marketed for patients homozygous for the F508del mutation.

CTP-656 Opportunity

CTP-656 is a novel, next generation potentiator that we are initially developing for the treatment of cystic fibrosis in patients who have gating mutations, including the G551D mutation. CTP-656 was discovered by applying our deuterium chemistry technology to modify ivacaftor, which is the current standard of care for this population. Due to its differentiated pharmacokinetic profile, CTP-656 has the potential to offer a greater therapeutic benefit relative to ivacaftor for this patient population. The potential benefits of CTP-656 include improved efficacy due to better treatment adherence, as a result of once-daily dosing and increased exposure to the parent drug, which is more active than the metabolites; and fewer drug-drug interactions.

CTP-656 also has the potential to be a key component of combination therapies that enable the treatment of patients having many other CFTR mutations. To advance combination therapies of CTP-656, we intend to collaborate with companies who are focused on developing drugs that target other mechanisms of action and that we believe may be suitable to combine with CTP-656.

On March 3, 2017, we entered into an Asset Purchase Agreement with Vertex, through Vertex Pharmaceuticals (Europe) Limited, pursuant to which we agreed to sell and assign, subject to the satisfaction or waiver of certain conditions, the cystic fibrosis assets of the Company, including CTP-656, for up to $250 million. Additional information concerning the sale of CTP-656 is discussed further in Note 18 in the consolidated financial statements, Item 1A. and Item 9B., each appearing elsewhere in this Annual Report on Form 10-K.

Clinical Development of CTP-656

In December 2016, we announced the initiation of a U.S.-based Phase 2 clinical trial evaluating CTP-656 in patients who have gating mutations, including the G551D mutation. The Phase 2 clinical trial is a randomized, parallel-group, double-blind, placebo-controlled, clinical trial to evaluate the safety and efficacy of CTP-656 in cystic fibrosis patients with gating mutations who are receiving stable treatment with Kalydeco. Patients enrolled in the 28-day study will receive either 20 mg, 100 mg, or 150 mg of CTP-656 once-daily or placebo. There will also be an open-label Kalydeco comparator arm in the trial. Approximately 30-40 patients will be enrolled in the Phase 2 trial. The primary endpoint of the Phase 2 trial is a change from baseline in sweat chloride at Day 28. Secondary endpoints include change in percent predicted forced expiratory volume (FEV1) and change from baseline in CFQ-R Respiratory Domain. The U.S. Phase 2 trial is being conducted at multiple study sites within the Cystic Fibrosis Foundation’s Therapeutic Development Network. Top-line data are expected by year-end 2017.

In January 2017, subsequent to the initiation of the study, the U.S. Food and Drug Administration, or FDA, informed Concert that, in order to support dose selection for Phase 3, an adequate washout period, in which Kalydeco treatment is withheld, would be required in addition to a placebo-control.

Following the Asset Purchase Agreement with Vertex, we do not intend to initiate any new clinical trials with CTP-656 at this time.

In January 2017, we also announced that the FDA granted orphan drug designation for CTP-656, which provides various incentives for companies to develop products for rare diseases affecting fewer than 200,000 people in the United States.

During 2015 and 2016, we completed multiple Phase 1 clinical trials evaluating CTP-656. In Phase 1, CTP-656 demonstrated an increase in half-life, decreased clearance, and an overall increase in exposure compared to Kalydeco. We also showed that CTP-656 plasma exposure was less dependent on dietary conditions than has been reported for Kalydeco, allowing CTP-656 to be dosed without regard to fat content of food. CTP-656 was well-tolerated and its safety profile was comparable to that of Kalydeco. No serious adverse events were reported in Phase 1 studies.

CTP-543

Background on Alopecia Areata

Alopecia areata is an autoimmune disease affecting up to 650,000 Americans at any given time and that results in partial or complete loss of hair on the scalp or body. The scalp is the most commonly affected area. Onset of the disease can occur throughout life, however, disease onset typically occurs in patients 30 years of age or younger and affects both men and women. Alopecia areata can be associated with serious psychological consequences, including anxiety and depression. There are currently no drugs approved by the U.S. Food and Drug Administration (FDA) for the treatment of alopecia areata. Alopecia areata is one of the disease areas that the FDA will focus on under its Patient-Focused Drug Development Initiative (PFDDI) in 2017. The goal of the PFDDI is to bring patient perspectives into an earlier stage of product development.

CTP-543 Opportunity

CTP-543 was discovered by applying Concert's deuterium chemistry technology to modify ruxolitinib, which is commercially available under the name Jakafi® in the United States for the treatment of certain blood disorders. Ruxolitinib has been used to treat alopecia areata in academic settings, including an investigator-sponsored clinical trial, and has been shown to promote hair growth in individuals with moderate-to-severe disease. Published findings from an open-label clinical trial of 12 patients with moderate to severe alopecia areata conducted by investigators at Columbia University demonstrated that 20 mg of ruxolitinib administered orally twice daily resulted in substantial efficacy, including nearly complete reversal of the disease in most cases, in 75% of patients.

Clinical Development of CTP-543

In 2016, we completed single and multiple ascending dose Phase 1 trials. The single and multiple ascending dose trials enrolled a total of 77 healthy volunteers. The pharmacokinetic measurements showed increased exposure with increasing doses. CTP-543 was well-tolerated across all dose groups and there were no serious adverse events reported in subjects who received CTP-543. The safety and exposure observed with 16 mg of CTP-543 twice daily appeared comparable to the reported exposure of 20 mg ruxolitinib twice daily. In the multiple ascending dose Phase 1 trial of CTP-543, pharmacodynamic analyses were performed to assess the inhibition of IL-6- and IFN-gamma-mediated JAK/STAT signaling. Consistent with the established pharmacological activity of CTP-543, a dose-related reduction in IL-6-stimulated phosphorylated STAT3 was observed. Also, IFN-gamma-mediated STAT1 signaling, which is believed to play a key role in the pathogenesis of alopecia areata, was significantly inhibited in disease-relevant immune cell types at all doses evaluated.

We also conducted a Phase 1 crossover study evaluating the metabolite profiles of CTP-543 and ruxolitinib. In this study, except for the presence of deuterium, no new metabolites were observed with CTP-543.

The Company's planned Phase 2a trial will enroll approximately 100 patients with moderate-to-severe alopecia areata. The dose-ranging trial will evaluate four active arms of CTP-543 (4, 8, 12 and 16 mg BID) and a placebo control. The primary outcome measure of the Phase 2a trial will be the effect on treating hair loss as measured by the severity of alopecia tool (SALT) after 24 weeks of dosing. The trial will include an additional 28 weeks of dosing where all patients enrolled in the study will receive CTP-543. The trial is expected to commence in the first quarter of 2017 and top-line primary outcome data are expected by the end of 2017.

Collaboration Product Candidates

We have entered into several collaborative arrangements with companies to develop deuterium-modified versions of their marketed products. The deuterium product candidates may be developed for an existing indication or in new indications.

AVP-786

In February 2012, we granted Avanir Pharmaceuticals, Inc., or Avanir, an exclusive worldwide license to develop and commercialize deuterated dextromethorphan analogs, including the d_6-dextromethorphan compound, deudextromethorphan . Subsequent to our agreement, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. and is now a wholly owned subsidiary of Otsuka America, Inc.

Avanir is developing AVP-786, which is a combination of deudextromethorphan and an ultra-low dose of quinidine.

In November 2015, Avanir announced the initiation of the Phase 3 clinical program to evaluate the safety and efficacy of AVP-786 for the treatment of agitation associated with Alzheimer's disease. It expects to enroll approximately 700 patients in two Phase 3 trials. The Phase 3 trials are expected to be completed in the third quarter of 2018.

In addition, Avanir is conducting multiple Phase 2 trials exploring additional neurological indications.

CTP-730

In April 2013, we entered into a strategic worldwide collaboration with Celgene Pharmaceuticals, Inc., Celgene International Sarl and Celgene Corporation, together referred to as Celgene, related to certain deuterium-substituted compounds for the treatment of inflammation or cancer. While the collaboration has the potential to encompass multiple programs, it is initially focused on one program, CTP-730.

CTP-730 is a deuterated analog of apremilast. Apremilast is a selective phosphodiesterase 4 (PDE4) inhibitor approved for the treatment of psoriasis and psoriatic arthritis. We have completed the Phase 1 clinical evaluation of CTP-730. Once daily dosing of 50 mg of CTP-730 administered for seven days in the Phase 1 clinical trial demonstrated similar steady state exposure to historical data for 30 mg of apremilast twice daily. Treatment with CTP-730 was generally well-tolerated and no serious adverse events were observed. Celgene is responsible for any development of CTP-730 beyond the completed Phase 1 clinical trials. Celgene is assessing the path forward for CTP-730. However, CTP-730 has not advanced into new trials at this time.

JZP-386

In February 2013, we licensed the commercial rights to deuterated analogs of sodium oxybate, including JZP-386, to Jazz Pharmaceuticals under an exclusive worldwide license agreement. Sodium oxybate is the active ingredient in Xyrem®, marketed in the United States by Jazz Pharmaceuticals to treat two of the key symptoms of narcolepsy, excessive daytime sleepiness and cataplexy. JZP-386 is being developed for the potential treatment of patients with narcolepsy.

In May 2015, we and Jazz Pharmaceuticals announced the completion of a Phase 1 clinical study. Clinical data from this Phase 1 study demonstrated that JZP-386 provided favorable deuterium-related effects, including higher serum concentrations and correspondingly increased PD effects at clinically relevant time points compared to Xyrem® (sodium oxybate) oral solution. The safety profile of JZP-386 was similar to that observed with Xyrem.   Jazz Pharmaceuticals is responsible for any further development of JZP-386 and is continuing to evaluate once-nightly dosing.

INTELLECTUAL PROPERTY

We protect our product candidates through the use of patents, trade secrets and careful monitoring of our proprietary know-how. Our patents and patent applications, if they issue as patents, for our lead programs expire between 2028 and 2034. The expected expiration dates are before any patent term extension to which we may be entitled under the Drug Price Competition and Patent Term Restoration Act of 1984 (commonly referred to as the Hatch-Waxman Amendments) or equivalent laws in other jurisdictions where we have issued patents.

AVP-786

We hold U.S. patents and pending applications covering the composition of matter and methods of use of deudextromethorphan and other deuterated dextromethorphan analogs, as well as a U.S. patent application covering methods of use of certain other dextromethorphan compounds. These patents and patent applications are expected to expire between 2028 and 2030. We have corresponding patents and patent applications in Europe and Japan that are expected to expire in 2028. We have granted exclusive licenses under these patent rights to Avanir.

CTP-656

We hold U.S. patents covering the composition of matter of deuterated analogs of ivacaftor and methods of treating cystic fibrosis, and a corresponding U.S. patent application. The patents and the patent application are expected to expire in 2032. We have corresponding patent applications in Europe and Japan that are expected to expire in 2032. We have retained all of the CTP-656 patent rights.

CTP-543

We hold a U.S. patent covering the composition of matter of deuterated analogs of ruxolitinib and a corresponding U.S. patent application. The patent and the patent application are expected to expire in 2033. We have corresponding patent applications in Europe and Japan that are expected to expire in 2033. We have retained all of the CTP-543 patent rights.

JZP-386

We hold a U.S. patent, as well as a corresponding U.S. patent application, covering the composition of matter of deuterated analogs of sodium oxybate, including JZP-386, and methods of using them for treating certain diseases and disorders, including narcolepsy. This patent and patent application are expected to expire in 2030. We hold a corresponding European patent that is expected to expire in 2030. We also have U.S. patents covering pharmaceutical compositions of JZP-386 and methods of use of JZP-386 for treating certain diseases and disorders, including narcolepsy, as well as patent applications in the United States, Europe and Japan, covering the composition of matter and methods of use of JZP-386, that are expected to expire in 2032. We have granted exclusive licenses under these patent rights to Jazz Pharmaceuticals.

CTP-730

We hold U.S. patents and a U.S. patent application covering the composition of matter of CTP-730. The patents and the patent application are expected to expire in 2030. We also hold corresponding patents in Europe and Japan that are expected to expire in 2030. We have granted exclusive licenses under these patent rights to Celgene.

Other Product Candidates

We also have patent portfolios that are related to a number of other programs. These patent portfolios are wholly owned by us. These include issued patents or patent applications that claim deuterated analogs of more than 90 non-deuterated drugs and drug candidates.

The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In the United States and other countries in which we file, the patent term is 20 years from the earliest date of filing a non-provisional patent application.

Under U.S. patent law, the patent term may be extended by patent term adjustment due to certain failures of the U.S. Patent and Trademark Office to act in a timely manner. The patent term of a patent that covers an FDA-approved drug may also be eligible for patent term extension, which permits patent term restoration as compensation for the patent term lost during the FDA regulatory review process. The Hatch-Waxman Amendments permit a patent term extension of up to five years beyond the expiration of the patent. The length of the patent term extension is related to the length of time the drug is under regulatory review. Patent extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only one patent applicable to an approved drug may be extended. Similar provisions are available in Europe and other non-U.S. jurisdictions to extend the term of a patent that covers an approved drug. In the future, if and when our pharmaceutical products receive FDA approval, we expect to apply for patent term extensions on patents that we believe are eligible for such extension. We also intend to seek patent term extensions in other jurisdictions where these are available. However, there is no guarantee that the applicable authorities, including the FDA, will agree with our assessment of whether such extensions should be granted, and even if granted, the length of such extensions.

We also rely on trade secrets and careful monitoring of our proprietary know-how to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection, including our DCE Platform, such as:

- our methods of evaluating candidate compounds for deuteration;
- our bioanalytical methods for identifying and measuring metabolites formed by the *in vitro* and *in vivo* metabolism of deuterated compounds;
- our analytical methods for evaluating how selective deuterium substitution affects different pharmacokinetic and metabolic parameters *in vitro* and *in vivo* systems; and
- our methods to determine the degree of deuterium substitution in compounds we manufacture.

MANUFACTURING AND SUPPLY

We currently rely, and expect to continue to rely, on third parties for the manufacture of product candidates for our clinical trials. We obtain these manufacturing services, including both the manufacture of the active pharmaceutical ingredients and finished drug product, on a purchase order basis and have not entered into long-term contracts with any of these third party manufacturers. We expect to rely on third parties for commercial manufacturing for any of our product candidates that receive marketing approval.

We have successfully transferred the methods we use in our internal manufacturing to our third party manufacturers, allowing them to produce multi-kilogram quantities of clinical trial materials with similar or greater efficiency than we achieved internally. If any of our third party manufacturers should become unavailable to us for any reason, we believe that there are a number of potential replacements, although we might incur some delay in identifying and qualifying such replacements.

We believe that all of the deuterium that we use in manufacturing our product candidates is currently derived, directly or indirectly, from deuterium oxide. For most of our deuterium supply we rely on bulk supplies of deuterium oxide, which we currently source from multiple suppliers, including two located in North America, one of which is in the United States. In order to internationally transport any deuterium oxide that we purchase from foreign suppliers, we, or our U.S. supplier, may be required to obtain an export license from the country of origin and we may be required to obtain an International Import Certificate from the country of destination. We are also generally required to obtain an export license from the Nuclear Regulatory Commission before shipping deuterium oxide from the United States to any contract manufacturer in another country. Each of these documents specifies the maximum amount of deuterium oxide that we, or our suppliers, are permitted to either import or export. In particular, in order to obtain additional supplies of deuterium oxide from one of the foreign suppliers from which we have previously purchased deuterium oxide, the supplier will be required to obtain an additional export license from the country of origin and, as part of the export license application process, we may be required to obtain a U.S. import certificate. While we and our suppliers have obtained similar licenses and certificates in the past, we or our suppliers may not be able to obtain them in the future in a timely manner or at all.

Certain of our manufacturing processes for our product candidates incorporate deuterium by using deuterated chemical intermediates or reagents that are derived from deuterium oxide. For the deuterated chemical intermediates and reagents, we may be subject to the license requirements applicable to deuterium oxide. In addition, the manufacturer of the deuterated chemical intermediate or reagent may themselves be required to obtain deuterium oxide under applicable licensing requirements. Most of the manufacturers of these deuterated chemical intermediates and reagents are not located in countries that produce bulk quantities of deuterium oxide. Therefore, our ability to source these deuterated chemical intermediates or reagents will depend on the ability of these manufacturers to obtain deuterium oxide from other countries.

We purchase our raw materials on a purchase order basis and have not entered into long-term contracts with any of these third party suppliers. We believe that the raw materials for our product candidates are readily available and that the cost of manufacturing for our product candidates will not preclude us from selling them profitably, if approved for sale.

COMMERCIALIZATION

We have not yet established a sales, marketing or product distribution infrastructure. We plan to use a combination of third party collaboration, licensing and distribution arrangements and a focused in-house commercialization capability to sell any of our products that receive marketing approval. With respect to the United States, we plan to seek to retain full commercialization rights for products that we can commercialize with a specialized sales force and to retain co-promotion or similar rights when feasible in indications requiring a larger commercial infrastructure. We plan to collaborate with third parties for commercialization in the United States of any products that require a large sales, marketing and product distribution infrastructure. We also plan to collaborate with third parties for commercialization outside the United States.

We plan to build a marketing and sales management organization to create and implement marketing strategies for any products that we market through our own sales organization and to oversee and support our sales force. We expect the responsibilities of the marketing organization would include developing educational initiatives with respect to approved products and establishing relationships with thought leaders in relevant fields of medicine.

COMPETITION

The development and commercialization of new drug products is highly competitive. We expect that we, and our collaborators, will face significant competition from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide with respect to our product candidates that we, or they, may seek to develop or commercialize in the future. Specifically, there are a number of large pharmaceutical and biotechnology companies that currently market and sell products or are pursuing the development of product candidates for the treatment of neurologic disorders, inflammation, and cystic fibrosis, the key indications for our current research and development programs. Our competitors may succeed in developing, acquiring or licensing technologies and drug products that are more effective, have fewer or more tolerable side effects or are less costly than any product candidates that we are currently developing or that we may develop, which could render our product candidates obsolete and noncompetitive.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we, or our collaborators, may develop. Our competitors also may obtain FDA or other marketing approval for their products before we, or our collaborators, are able to obtain approval for ours, which could result in our competitors establishing a strong market position before we, or our collaborators, are able to enter the market.

Many of our existing and potential future competitors have significantly greater financial resources and expertise in research and development, manufacturing, nonclinical testing, conducting clinical trials, obtaining marketing approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Many pharmaceutical and biotechnology companies have begun to cover deuterated analogs of their product candidates in patent applications and may choose to develop these deuterated compounds. Some of these pharmaceutical and biotechnology companies may have significantly greater financial resources and expertise in research and development, manufacturing, nonclinical testing, conducting clinical trials, obtaining marketing approvals and marketing approved products than we do. In addition, we know of other companies that are broadly utilizing deuterium substitution for drug development, including Auspex Pharmaceuticals, Inc., a wholly owned subsidiary of Teva Pharmaceutical Industries Ltd., and DeuteRx LLC. In some cases, these competitors may be interested in developing deuterated compounds that we may be interested in developing for ourselves. In addition, these competitors may enter into collaborative arrangements or business combinations that result in their ability to research and develop deuterated compounds more effectively than us. Our potential competitors also include academic institutions, government agencies and other public and private research organizations.

CTP-656

We are initially developing CTP-656, a deuterated analog of ivacaftor, as a treatment for cystic fibrosis in individuals with gating mutations of the CFTR gene, such as G551D. The current standard of care for this population is ivacaftor, which is marketed by Vertex Pharmaceuticals, Inc. under the name Kalydeco®. If CTP-656 receives marketing approval, it would compete with this product and may face competition from a number of other product candidates that are currently in clinical development by AbbVie and Galapagos Pharmaceuticals, Flatley Labs, Novartis and Proteostasis, including additional candidates being developed by Vertex, among others.

CTP-543

CTP-543 is a deuterated analog of ruxolitinib, which is being developed for the treatment of moderate-to-severe alopecia areata, an autoimmune disease that results in partial or complete loss of hair on the scalp and body. If CTP-543 receives marketing approval for this indication, it may face competition from a number of other product candidates that are being studied for alopecia areata. The non-deuterated analog of CTP-543, ruxolitinib, is being developed as a topical treatment for alopecia areata by Incyte, who markets ruxolitinib (Jakafi®) in the U.S. for myelofibrosis and polycythemia vera. Aclaris Therapeutics and Pfizer are pursuing the development of other Janus, kinase inhibitors, or JAK inhibitors, with differing subtype selectivity for alopecia areata. In addition, various academic investigators, are conducting or have conducted efficacy trials in alopecia areata, including with currently approved JAK inhibitors such as ruxolitinib and tofacitinib (Xeljanz®).

AVP-786

Avanir is developing AVP-786 for the treatment of agitation associated with Alzheimer's disease and other neurological indications. There are marketed drugs and product candidates in clinical development for each indication. Intra-Cellular Therapies is developing a treatment for agitation in patients with dementia, including Alzheimer's Disease.

JZP-386

JZP-386 is a deuterated analog of sodium oxybate, which is being developed for the treatment of excessive daytime sleepiness and cataplexy in patients with narcolepsy. The current standard of care is treatment with sodium oxybate, which is marketed by Jazz Pharmaceuticals, Inc., under the name Xyrem®. Avadel Pharmaceuticals is developing an extended release formulation of sodium oxybate for the treatment of narcolepsy. Roxane Laboratories, Inc. developed a generic version of Xyrem® for the treatment of narcolepsy, which was approved by the FDA in January 2017 but is not yet marketed pending ongoing litigation.

CTP-730

CTP-730 is a phosphodiesterase 4, or PDE4, inhibitor that has potential for the treatment of various inflammatory diseases. The non-deuterated drug apremilast is marketed for certain types of psoriasis and psoriatic arthritis. It is also being evaluated for efficacy in other chronic inflammatory diseases. If CTP-730 receives marketing approval, the competition it may face will depend on the particular inflammatory disease for which it receives approval.

GOVERNMENT REGULATIONS

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, manufacturing changes, packaging, storage, recordkeeping, labeling, advertising, promotion, sales, distribution, marketing, 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 authorities, require the expenditure of substantial time and financial resources.

Review and Approval of Drugs in the United States

In the United States, the FDA regulates drugs under The Federal Food, Drug, and Cosmetic Act, or FDCA, and implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements 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 nonclinical laboratory tests, animal studies and formulation studies in compliance with the FDA’s good laboratory practice, or GLP, regulations;

- production of well-characterized drug substance and drug product, and potentially matching placebos;

- submission to the FDA of an investigational new drug application, or IND application, which allows human clinical trials to begin unless the FDA otherwise informs the drug’s sponsor within 30 days;

- agreement by clinical investigators and their clinical trial sites, followed by approval by an independent institutional review board, or IRB, representing each clinical site, before the clinical trial may be initiated at that site;
- performance of adequate and well-controlled human clinical trials in accordance with the FDA's current Good Clinical Practices, or GCPs, to establish the safety and efficacy of the proposed drug product for each indication;
- preparation and submission to the FDA of a New Drug Application, or NDA;
- review of the NDA 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 drug product, and the active pharmaceutical ingredient or active ingredients thereof, are produced to assess compliance with current good manufacturing practices and to assure that the facilities, methods and controls are adequate to ensure the product's identity, strength, quality and purity;
- payment of user fees and securing FDA approval of the NDA; and
- compliance with any post-approval requirements, including REMS and post-approval studies required by the FDA.

Nonclinical Studies and an IND

Nonclinical studies can include *in vitro* and animal studies to assess the potential for efficacy and adverse events and, in some cases, to establish a rationale for human therapeutic use. The conduct of nonclinical studies is subject to federal regulations and requirements, including GLP regulations. Other studies include laboratory evaluation of the purity, stability and physical form of the manufactured drug substance or active pharmaceutical ingredient and the physical properties, stability and reproducibility of the formulated drug or drug product. An IND sponsor must submit the results of the relevant nonclinical tests, including all tests conducted under GLP conditions, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, to the FDA as part of an IND. Some nonclinical testing, such as longer-term toxicity testing, animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to a proposed clinical trial and places the trial on clinical hold or partial clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Following commencement of a clinical trial under an IND, the FDA may place a 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.

Human Clinical Studies 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 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. In addition, 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 continuing review and reapprove the study at least annually. The IRB must review and approve, among other things, the study protocol and informed consent information to be provided to study subjects. An IRB must operate in compliance with FDA regulations. Information about certain clinical trials must be submitted within specific timeframes to the NIH for public dissemination on their ClinicalTrials.gov website. Human clinical trials are typically conducted in three sequential phases, which may overlap or be combined:

Phase 1: The product candidate is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness.

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 for specific targeted diseases and to determine dosage tolerance and dosage for Phase 3 studies.

Phase 3: 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 for approval, to establish the overall risk-benefit profile of the product, and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and more frequently if serious adverse events occur. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, the FDA or the sponsor 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 often inspect one or more clinical sites in late-stage clinical trials to assure compliance with GCP and the integrity of the clinical data submitted.

Section 505(b)(2) NDAs

NDAs for most new drug products are based on two adequate and well-controlled clinical trials which must contain substantial evidence of the safety and efficacy of the proposed new product. These applications are generally submitted under Section 505(b)(1) of the FDCA. The FDA is, however, authorized to approve an alternative type of NDA under Section 505(b)(2) of the FDCA. This latter type of application allows the applicant to rely, in part, on the FDA's previous findings of safety and efficacy for a similar reference product, or may rely on published literature. Specifically, Section 505(b)(2) applies to NDAs for a drug for which the applicant relies, as part of its application, on investigations made to show whether or not the drug is safe and effective for use "that were not conducted by or for the applicant and for which the applicant has not obtained a right of reference or use from the person by or for whom the investigations were conducted."

Thus, Section 505(b)(2) authorizes the FDA to approve an NDA based on safety and effectiveness data that were not developed by the applicant. NDAs filed under Section 505(b)(2) may provide an alternate and potentially more expeditious pathway to FDA approval for new or improved formulations or new uses of previously approved products. If the 505(b)(2) applicant can establish that reliance on the FDA's previous approval is scientifically appropriate, the applicant may eliminate the need to conduct certain nonclinical or clinical studies of the new product. The FDA may also require companies to perform additional studies or measurements to support the change from the approved product. The FDA may then approve the new drug candidate for all or some of the label indications for which the referenced product has been approved, as well as for any new indication sought by the Section 505(b)(2) applicant.

If our partners submit NDAs for approval of deuterated analogs of marketed compounds for which they are the NDA holder, we believe that in certain cases the FDA may allow referencing of data from the non-deuterated compound in support of the application for approval of the deuterated product. Since this referencing by our partners would involve use of their own data and not require the use of another party's data, it would constitute a Section 505(b)(1) application.

Submission of an NDA to the FDA

Assuming successful completion of required clinical testing and other requirements, the results of the nonclinical and clinical studies, 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 drug product for one or more indications. Under federal law, the submission of most NDAs is additionally subject to a number of application and user fees.

Under certain circumstances, the FDA will waive the application fee for the first human drug application that a small business, defined as a company with less than 500 employees, or its affiliate submits for review. An affiliate is defined as a business entity that has a relationship with a second business entity if one business entity controls, or has the power to control, the other business entity, or a third party controls, or has the power to control, both entities.

The FDA conducts a preliminary review of an NDA within 60 days of its receipt and informs 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. 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 specified 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. 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 manufactured. 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 FDA also may require submission of a risk evaluation and mitigation strategy, or REMS, plan to mitigate any identified or suspected serious risks. The REMS plan could include medication guides, physician communication plans, assessment plans, and elements to assure safe use, such as restricted distribution methods, patient registries, or other risk minimization tools.

The FDA is required to 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.

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 or information in order for the FDA to reconsider the application. 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, some 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.

The product may also be subject to official lot release, meaning that the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release, the manufacturer must submit samples of each lot, together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot, to the FDA. The FDA may in addition perform certain confirmatory tests on lots of some products before releasing the lots for distribution. Finally, the FDA will conduct laboratory research related to the safety and effectiveness of drug products.

Post-Approval Requirements

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 or problems with manufacturing processes of unanticipated severity or frequency, 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, 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 marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

In addition, the distribution of prescription pharmaceutical products is subject to the Prescription Drug Marketing Act, or PDMA, which regulates the distribution of drugs and drug samples at the federal level, and sets minimum standards for the registration and regulation of drug distributors by the states. Both the PDMA and state laws limit the distribution of prescription pharmaceutical product samples and impose requirements to ensure accountability in distribution.

Abbreviated New Drug Applications for Generic Drugs

In 1984, with passage of the Hatch-Waxman Amendments to the FDCA, Congress authorized the FDA to approve generic drugs that are the same as drugs previously approved by the FDA under the NDA provisions of the statute. To obtain approval of a generic drug, an applicant must submit an abbreviated new drug application, or ANDA, to the agency. In support of such applications, a generic manufacturer may rely on the nonclinical and clinical testing previously conducted for a drug product previously approved under an NDA, known as the reference listed drug, or RLD. To reference that information, however, the ANDA applicant must demonstrate, and the FDA must conclude, that the generic drug does, in fact, perform in the same way as the RLD it purports to copy.

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, and the strength 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 a RLD if “the rate and extent of absorption of the generic drug do not show a significant difference from the rate and extent of absorption of the reference listed drug. . . .”

Upon approval of an ANDA, the FDA indicates that the generic product is “therapeutically equivalent” to the RLD and it assigns a therapeutic equivalence rating to the approved generic drug in its publication “Approved Drug Products with Therapeutic Equivalence Evaluations,” also referred to as the “Orange Book.” Physicians and pharmacists consider the therapeutic equivalence rating to mean that a generic drug is fully substitutable for the RLD. In addition, by operation of certain state laws and numerous health insurance programs, the FDA’s designation of a therapeutic equivalence rating 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 data exclusivity for new drug containing a new chemical entity. For the purposes of this provision, a new chemical entity is a drug that contains no active moiety that has been previously approved by 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 new chemical entity 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. 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 new chemical entity 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.

Hatch-Waxman Patent Certification and the 30 Month Stay

NDA sponsors are required to list with the FDA each patent with claims that cover the applicant's product or a 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.

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 indicate that it is not seeking approval of a patented method of use, the ANDA application will not be approved until all the listed patents claiming the referenced product have expired.

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, expiration of the patent, settlement of the lawsuit or a decision in the infringement case that is favorable to the ANDA applicant.

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. As a result, approval of a 505(b)(2) NDA can be stalled until all the listed patents claiming the referenced product have expired, until any non-patent exclusivity, such as exclusivity for obtaining approval of a new chemical entity, listed in the Orange Book for the referenced product has expired, and, in the case of a Paragraph IV certification and subsequent patent infringement suit, until the earlier of 30 months, settlement of the lawsuit or a decision in the infringement case that is favorable to the Section 505(b)(2) applicant.

Pediatric Studies and Exclusivity

Under the Pediatric Research Equity Act of 2003, a 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 applicant, the FDA, and the FDA's internal review committee must then review the information submitted, consult with each other, and agree upon a final plan. The FDA or the applicant may request an amendment to the plan at any time.

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. Additional requirements and procedures relating to deferral requests and requests for extension of deferrals are contained in FDASIA. Unless otherwise required by regulation, the pediatric data requirements do not apply to products with orphan designation.

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 to be 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 accept or approve another application.

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 Amendments. Those Amendments permit 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 a NDA, plus the time between the submission date of a NDA and ultimate approval. 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. 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 in the European Union

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 our 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.

Pursuant to the European Clinical Trials Directive, a system for the approval of clinical trials in the European Union has been implemented through national legislation of the member states. Under this system, an applicant must obtain approval from the competent national authority of a European Union member state in which the clinical trial is to be conducted. Furthermore, the applicant may only start a clinical trial after a competent ethics committee has issued a favorable opinion. Clinical trial applications must be accompanied by an investigational medicinal product dossier with supporting information prescribed by the European Clinical Trials Directive and corresponding national laws of the member states and further detailed in applicable guidance documents.

To obtain marketing approval of a drug under European Union 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 European Union 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 European Medicines Agency, or EMA, is responsible for issuing an Opinion following the initial assessment of an MAA. Under the centralized procedure, 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. Following a positive Opinion by the CHMP the final authorization is issued by the European Commission.

The decentralized procedure is available to applicants who wish to market a product in various European Union member states where such product has not received marketing approval in any European Union member states 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 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 120 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.

Data and Market Exclusivity in the European Union

In the European Union, new chemical entities qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. This data exclusivity, if granted, prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic (abbreviated) application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. 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 their authorization, are held to bring a significant clinical benefit in comparison with existing therapies. Even if a compound is considered to be a new chemical entity and the sponsor is able to gain the prescribed period of data exclusivity, another company nevertheless could also market another version of the drug if such company can complete a full MAA with a complete database of pharmaceutical test, nonclinical tests and clinical trials and obtain marketing approval of its product.

Pharmaceutical Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of products approved by the FDA and other government authorities. Sales of products 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 such products. 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 for medical products and services and imposing controls to manage costs. Third-party payors may limit coverage to specific products on an approved list, or 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 regulatory approvals. A payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Third-party reimbursement may not be sufficient to maintain price levels high enough to realize an appropriate return on our investment in product development.

The containment of healthcare costs has also 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 adversely affect our net revenue and results.

Outside of the United States, ensuring adequate coverage and payment for products remains challenging. 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 us to conduct a clinical trial that compares the cost effectiveness of our product candidates or products to other available therapies. The conduct of such a clinical trial could be expensive and result in delays in our commercialization efforts.

As a result, the marketability of any product which receives regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, an increasing emphasis on managed care in the United States has increased and will continue to increase the pressure on drug pricing. Coverage policies, third-party reimbursement rates and drug pricing regulation may change at any time. In particular, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, contains provisions that may reduce the profitability of drug products, including, for example, increased rebates for drugs sold to Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Even if favorable coverage and reimbursement status is attained for one or more products that receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

In the European Union, pricing and reimbursement schemes vary widely from country to country. Some countries provide that drug 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 product candidate to currently available therapies. For example, the European Union provides options for its member states to restrict the range of drug products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. European Union member states may approve a specific price for a drug product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the drug product on the market. Other member states allow companies to fix their own prices for drug products, but monitor and control company profits. 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. In addition, in some countries, cross-border imports from low-priced markets exert competitive pressure that may reduce pricing within a country. Any country that has price controls or reimbursement limitations for drug products may not allow favorable reimbursement and pricing arrangements for any of our products.

Healthcare Law and Regulation

Healthcare providers, physicians and third-party payors will play a primary role in the recommendation and prescription of drug products that are granted marketing approval. Arrangements with third-party payors and customers are subject 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 our products for which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations, include the following:

- the federal healthcare Anti-Kickback Statute prohibits, among other things, persons and entities from knowingly and willfully soliciting, offering, 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 False Claims Act, which imposes civil monetary penalties, and provides for civil whistleblower or qui tam actions, against individuals or entities for, among other things, knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false 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 imposes federal criminal and civil liability for, among other things, knowingly and willingly 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 its 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 false statements statute 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 federal transparency requirements under the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or the Affordable Care Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies to report to the Department of Health and Human Services information related to payments and other transfers of value to physicians and teaching hospitals and physician ownership and investment interests; 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 non-governmental third-party payors, including private insurers.

Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures. 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.

Regulation of Deuterium Oxide

We believe that all of the deuterium that we use in manufacturing our product candidates is currently derived, directly or indirectly, from deuterium oxide. For most of our deuterium supply we rely on bulk supplies of deuterium oxide, which we currently source from multiple suppliers, including two located in North America, one of which is located in the United States. In order to internationally transport any deuterium oxide that we purchase from foreign suppliers, we, or our U.S. supplier, may be required to obtain an export license from the country of origin and we may be required to obtain an International Import Certificate from the country of destination. We are also generally required to obtain an export license from the Nuclear Regulatory Commission before shipping deuterium oxide from the United States to any contract manufacturer in another country. Each of these documents specifies the maximum amount of deuterium oxide that we, or our suppliers, are permitted to either import or export. We have obtained a license from the Nuclear Regulatory Commission, or NRC, for the export of 20,000 kilograms of heavy water over the life of the license, which is valid until January 2019. We have obtained an additional export license from the NRC for the export of 20,000 kilograms of heavy water over the life of the license, which is valid until March 2020. In addition, in order to obtain additional supplies of deuterium oxide from one of the foreign suppliers from which we have previously purchased deuterium oxide, the supplier will be required to obtain an additional export license from the country of origin and, as part of the export license application process, we may be required to obtain a U.S. import certificate. While we and our suppliers have obtained similar licenses and certificates in the past, we or our suppliers may not be able to obtain them in the future in a timely manner or at all. We have not obtained an export license from the country in which our potential future foreign supplier is located. In addition, if any of our product candidates is approved by the FDA, then the FDA will also have regulatory jurisdiction over the manufacture and use of deuterium oxide in such product.

EMPLOYEES

As of December 31, 2016, we had 69 employees, 47 of whom were primarily engaged in research and product development activities. A total of 24 employees have Ph.D. degrees. None of our employees are represented by a labor union and we believe our relations with our employees are good.

FACILITIES

Our offices are located in Lexington, Massachusetts, consisting of approximately 50,000 square feet of leased office and laboratory space. The term of the lease expires in September 2018.

RESEARCH AND DEVELOPMENT

We have dedicated a significant portion of our resources to our efforts to develop our pipeline and product candidates. We incurred research and development expenses of $37.0 million, $28.9 million and $27.5 million during the years ended December 31, 2016, 2015 and 2014, respectively. We anticipate that a significant portion of our operating expenses in future periods will continue to be related to research and development as we continue to advance our product candidates through clinical development.

LEGAL PROCEEDINGS

We are not currently a party to any material legal proceedings.

AVAILABLE INFORMATION

We file reports and other information with the Securities and Exchange Commission, or SEC, as required by the Securities Exchange Act of 1934, as amended, which we refer to as the Exchange Act. You can find, copy and inspect information we file at the SEC's public reference room, which is located at 100 F Street, N.E., Room 1580, Washington, DC 20549. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the SEC's public reference room. You can review our electronically filed reports and other information that we file with the SEC on the SEC's web site at http://www.sec.gov.

We were incorporated under the laws of the State of Delaware on April 12, 2006 as Concert Pharmaceuticals, Inc. Our principal executive offices are located at 99 Hayden Avenue, Suite 500, Lexington, Massachusetts, 02421, and our telephone number is (781) 860-0045. Our Internet website is http://www.concertpharma.com. We make available free of charge through our website our Annual Report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Exchange Act. We make these reports available through our website as soon as reasonably practicable after we electronically file such reports with, or furnish such reports to, the SEC. In addition, we regularly use our website to post information regarding our business, product development programs and governance, and we encourage investors to use our website, particularly the information in the section entitled "Investors," as a source of information about us.

The foregoing references to our website are not intended to, nor shall they be deemed to, incorporate information on our website into this Annual Report on Form 10-K by reference.

Item 1A. Risk Factors.

Our business is subject to numerous risks. The following important factors, among others, could cause our actual results to differ materially from those expressed in forward-looking statements made by us or on our behalf in this Annual Report on Form 10-K and other filings with the Securities and Exchange Commission, or the SEC, press releases, communications with investors and oral statements. Actual future results may differ materially from those anticipated in our forward-looking statements. We undertake no obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise.

RISKS RELATED TO OUR FINANCIAL POSITION AND NEED FOR ADDITIONAL CAPITAL

We have incurred significant losses since inception, expect to incur losses for at least the next several years and may never sustain profitability.

We have incurred significant annual net operating losses in every year since our inception, except for fiscal year 2015. Although we were profitable for fiscal year 2015 as a result of a one-time payment of $50.2 million that we received in June 2015, as a result of our patent assignment agreement with Auspex, we expect to incur significant annual net operating losses in future periods. As of December 31, 2016, we had an accumulated deficit of $171.9 million . We have not generated any revenues from product sales and have financed our operations to date primarily through the public offering of our common stock, private placements of our preferred stock, debt financings and funding from collaborations and a patent assignment agreement. We have not completed development of any product candidate and have devoted substantially all of our financial resources and efforts to research and development, including nonclinical studies and our clinical development programs. We expect to continue to incur significant expenses and increasing operating losses for at least the next several years. Our net losses may fluctuate significantly from quarter to quarter and year to year. Net losses and negative cash flows have had, and will continue to have, an adverse effect on our stockholders' equity and working capital.

We anticipate that our expenses will increase substantially if and as we:

- continue to develop and conduct nonclinical studies and clinical trials with respect to our product candidates;
- seek to identify additional product candidates;
- in-license or acquire additional product candidates;
- seek marketing approvals for our product candidates that successfully complete clinical trials;
- establish sales, marketing, distribution and other commercial infrastructure in the future to commercialize various products for which we may obtain marketing approval;
- require the manufacture of larger quantities of product candidates for clinical development and potentially commercialization;
- maintain, expand and protect our intellectual property portfolio;
- hire additional personnel;
- add equipment and physical infrastructure to support our research and development; and
- continue to implement the infrastructure necessary to support our product development and help us comply with our obligations as a public company.

Our ability to become and remain profitable depends on our ability to generate revenue. We do not expect to generate significant revenue unless and until we are, or one of our collaborators is, able to successfully commercialize one or more of our product candidates. This will require success in a range of challenging activities, including completing clinical trials of our product candidates, obtaining marketing approval for these product candidates, manufacturing, marketing and selling those products for which we, or our collaborators, may obtain marketing approval, satisfying any post-marketing requirements and obtaining reimbursement for our products from private insurance or government payors. We, and our collaborators, may never succeed in these activities and, even if we do, or one of our collaborators does, we may never generate revenues that are large enough for us to achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would decrease the value of our Company and could impair our ability to raise capital, expand our business, maintain our research and development efforts, diversify our pipeline of product candidates or continue our operations. A decline in the value of our Company could cause our stockholders to lose all or part of their investments in us.

We have a limited operating history and no history of commercializing pharmaceutical products, which may make it difficult to evaluate the prospects for our future viability.

We began operations in April 2006. Our operations to date have been limited to financing and staffing our Company, developing our technology and product candidates and establishing collaborations. We have not yet demonstrated an ability to successfully conduct an international multi-center clinical trial, conduct a large-scale pivotal clinical trial, obtain marketing approvals, manufacture product on a commercial scale or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing pharmaceutical products.

We will need substantial additional funding. If we are unable to raise capital when needed, we could be forced to delay, reduce or eliminate our product development programs or commercialization efforts.

Developing pharmaceutical products, including conducting nonclinical studies and clinical trials, is a very time-consuming, expensive and uncertain process that takes years to complete. We expect our expenses to increase in connection with our ongoing activities, particularly as we initiate new clinical trials of, initiate new research and nonclinical development efforts for and seek marketing approval for, our product candidates, or if we in-license or acquire product candidates. In addition, if we obtain marketing approval for any of our product candidates, we may incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution to the extent that such sales, marketing and distribution are not the responsibility of one of our collaborators. In particular, the costs that we may be required to incur for the manufacture of any product candidate that receives marketing approval may be substantial. To our knowledge, no deuterated drug has ever been successfully commercialized. Manufacturing a deuterated drug at commercial scale may require specialized facilities, processes and materials. Furthermore, we will continue to incur costs associated with operating as a public 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 may be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

In any event, our existing cash and cash equivalents and investments will not be sufficient to fund all of the efforts that we plan to undertake or to fund the completion of development of any of our product candidates. Accordingly, we will be required to obtain further funding through public or private equity offerings, debt financings, collaborations and licensing arrangements or other sources. Adequate additional financing may not be available to us on acceptable terms, or at all. Our failure to raise capital when needed would have a negative impact on our financial condition and our ability to pursue our business strategy.

Based on our current expectations, including with respect to our development plans, we believe our existing cash and cash equivalents and investments as of December 31, 2016 will enable us to fund our operating expenses and capital expenditure requirements through the second quarter of 2018. Upon closing of the CTP-656 asset purchase agreement, we expect our cash will be sufficient to fund the Company into 2021 under our current operating plan. Our estimate as to how long we expect our cash and cash equivalents and investments to be able to continue to fund our operations is based on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Changing circumstances could cause us to consume capital significantly faster than we currently anticipate, and we may need to spend more money than currently expected because of circumstances beyond our control. Our future funding requirements, both short-term and long-term, will depend on many factors, including:

- the successful closing of our asset sale with Vertex;
- the progress, timing, costs and results of clinical trials of, and research and nonclinical development efforts for, our product candidates and potential product candidates, including current and future clinical trials;
- our current collaboration agreements and achievement of milestones under these agreements;
- our ability to enter into and the terms and timing of any additional collaborations, licensing, product acquisition or other arrangements that we may establish;
- the number of product candidates that we pursue and their development requirements;
- the outcome, timing and costs of seeking regulatory approvals;
- our headcount growth and associated costs as we expand our research and development and establish a commercial infrastructure;
- the costs of preparing, filing and prosecuting patent applications, maintaining and protecting our intellectual property rights and defending against intellectual property related claims; and
- the costs of operating as a public company.

Raising additional capital may cause dilution to our stockholders or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of public or private equity offerings, debt financings, additional collaborations and licensing arrangements and other sources. We do not have any committed external source of funds, other than potential milestone payments and royalties under our collaborations with Celgene, Avanir and Jazz Pharmaceuticals, each of which is subject to the achievement of development, regulatory and/or sales-based milestones with respect to our product candidates. To the extent that we raise additional capital through the sale of common stock, convertible securities or other equity securities, the ownership interests of our stockholders may be materially diluted, and the terms of these securities could include liquidation or other preferences and anti-dilution protections that could adversely affect the rights of our stockholders. In addition, debt financing, if available, would result in increased fixed payment obligations and may involve agreements that include restrictive covenants that limit our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends, that could adversely impact our ability to conduct our business.

If we raise additional funds through collaborations or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams or product candidates or grant licenses on terms that may not be 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 future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Any future indebtedness could adversely affect our ability to operate our business.

We could in the future incur indebtedness containing financial obligations and restrictive covenants, which could have significant adverse consequences, including:

- requiring us to dedicate a portion of our cash resources to the payment of interest and principal, reducing money available to fund working capital, capital expenditures, product development and other general corporate purposes;
- increasing our vulnerability to adverse changes in general economic, industry and market conditions;
- subjecting us to restrictive covenants that may reduce our ability to take certain corporate actions or obtain further debt or equity financing;
- limiting our flexibility in planning for, or reacting to, changes in our business and the industry in which we compete; and
- placing us at a competitive disadvantage compared to our competitors that have less debt or better debt servicing options.

Any financial obligations or restrictive covenants could negatively impact our ability to conduct our business.

RISKS RELATED TO THE DISCOVERY, DEVELOPMENT AND COMMERCIALIZATION OF OUR PRODUCT CANDIDATES

Our approach to the discovery and development of product candidates based on selective deuteration is unproven, and we do not know whether we will be able to develop any products of commercial value.

We are focused on discovering and developing novel small molecule drugs that have improved metabolic or pharmacokinetic characteristics as a result of our selective substitution of deuterium for hydrogen. We apply our proprietary platform to systematically identify approved drugs, advanced clinical candidates or previously studied compounds that we believe can be improved with deuterium substitution to provide better pharmacokinetic or metabolic properties and thereby enhance clinical safety, efficacy and convenience. To our knowledge, no deuterated drug has ever been approved for sale in the United States. While we believe that selective deuteration can produce compounds that possess favorable pharmaceutical properties, we have not yet succeeded and may not succeed in demonstrating efficacy and safety for any of our product candidates in pivotal clinical trials or in obtaining marketing approval thereafter.

Clinical drug development involves a lengthy and expensive process with an uncertain outcome.

Clinical testing is expensive, time-consuming and uncertain as to outcome. We cannot guarantee that any clinical trials will be conducted as planned or completed on schedule, if at all. The clinical development of our product candidates is susceptible to the risk of failure inherent at any stage of drug development, including failure to demonstrate efficacy in a clinical trial or across a broad or definable population of patients, the occurrence of severe or medically or commercially unacceptable adverse events, fraudulent conduct by clinical investigators, failure to comply with protocols, applicable regulatory requirements or other determinations made by the Food and Drug Administration, or FDA, or any comparable foreign regulatory authority that a drug product is not approvable. It is possible that even if one or more of our product candidates has a beneficial effect, that effect will not be detected during clinical evaluation as a result of one or more of a variety of factors, including the size, duration, design, measurements, conduct or analysis of our clinical trials. Conversely, as a result of the same factors, our clinical trials may indicate an apparent positive effect of a product candidate that is greater than the actual positive effect, if any. Similarly, in our clinical trials, we may fail to detect toxicity of or intolerability caused by our product candidates, or mistakenly believe that our product candidates are toxic or not well tolerated when that is not in fact the case.

While we believe that our DCE Platform may enable drug discovery and clinical development that is more efficient and less expensive than conventional small molecule drug research and development, we may not be able to realize the advantages that we expect. In addition, while a key element of our drug discovery and development strategy involves utilizing existing information regarding non-deuterated compounds to assist the discovery and development of deuterated analogs of those compounds, not all of the product candidates that we develop are based on drugs or drug candidates that progressed into advanced clinical development. Particularly in these situations, existing information regarding the corresponding non-deuterated compound may not be sufficient to mitigate drug development risks.

In addition to the risk of failure inherent in drug development, certain of the deuterated compounds that we, and our collaborators, are developing and may develop in the future may be particularly susceptible to failure to the extent they are based on compounds that others have previously studied or tested, but did not progress in development due to safety, tolerability or efficacy concerns or otherwise. Deuteration of these compounds may not be sufficient to overcome the problems experienced with the corresponding non-deuterated compound.

We may not be able to continue further clinical development of our wholly owned development programs, including CTP-656 and CTP-543. If we are unable to develop, obtain marketing approval for or commercialize our wholly owned development programs, ourselves or through a collaboration, or experience significant delays in doing so, our business could be materially harmed.

We currently have no products approved for sale. The success of our wholly owned development programs will depend on several factors, including:

- in the case of CTP-656, our ability to enroll sufficient numbers of patients and in a timely manner to conduct our clinical trials;
- in the case of CTP-656, if we need to develop it in combination with other agents to maximize its therapeutic and sales potential, our ability to license such combinations and our, or any collaborator's, ability to develop such combinations;
- in the case of CTP-656, the ability of our current Phase 2 trial, or any Phase 2 trial that we can practicably conduct, to support progression to Phase 3 clinical trials;
- in the case of CTP-656, our ability to agree with regulatory agencies on a Phase 3 trial design that we can practicably conduct;
- in the case of CTP-543, our ability to safely and effectively treat moderate-to-severe alopecia areata;
- successful completion of clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- the performance of our future collaborators, if any, for our programs;
- the extent of any required post-marketing approval commitments to applicable regulatory authorities;
- establishment of supply arrangements with third party raw materials suppliers and manufacturers;
- our ability to manufacture or arrange for the manufacture of our active pharmaceutical ingredients and drug products
- with sufficient quality, quantity, and reproducibility to support clinical trials and potential future commercialization;
- establishment of arrangements with third party manufacturers to obtain finished drug products that are appropriately packaged for sale;
- obtaining and maintaining patent, trade secret protection, regulatory exclusivity, and freedom to operate, both in the United States and internationally;
- amount of commercial sales, if and when approved;
- a continued acceptable safety profile of our programs following any marketing approval; and
- agreement by third party payors to reimburse patients for the costs of treatment with our products, and the terms of such reimbursement.

If we are unable to successfully develop, receive marketing approval for, and commercialize our wholly owned development programs, or experience delays as a result of any of these factors or otherwise, our business could be materially harmed.

If clinical trials of our product candidates fail to satisfactorily demonstrate safety and efficacy to the FDA and other regulators, we, or our collaborators, may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of these product candidates.

We, or our collaborators, must complete nonclinical development and then conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans in order to obtain marketing approval from regulatory authorities for the sale of our product candidates. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is inherently uncertain as to outcome. Further, the outcome of nonclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, nonclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in earlier development, and we cannot be certain that we will not face similar setbacks.

Any inability to successfully complete nonclinical and clinical development could result in additional costs to us, or our collaborators, and impair our ability to generate revenues from product sales, regulatory and commercialization milestones and royalties. In addition, if (1) we, or our collaborators, are required to conduct additional clinical trials or other testing of our product candidates beyond the trials and testing that we, or they, contemplate, (2) we, or our collaborators, are unable to successfully complete clinical trials of our product candidates or other testing, (3) the results of these trials or tests are unfavorable, uncertain or are only modestly favorable, or (4) there are unacceptable safety concerns associated with our product candidates, we, or our collaborators, in addition to incurring additional costs, may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or significant safety warnings, including boxed warnings;
- be subject to additional post-marketing testing or other requirements; or
- be required to remove the product from the market after obtaining marketing approval.

Even if we, or our collaborators, believe that the results of clinical trials for our product candidates warrant marketing approval, the FDA or comparable foreign regulatory authorities may disagree and may not grant marketing approval of our product candidates.

If we, or our collaborators, experience any of a number of possible unforeseen events in connection with clinical trials of our product candidates, potential marketing approval or commercialization of our product candidates could be delayed or prevented.

We, or our collaborators, may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent marketing approval of our product candidates, including:

- toxicity or serious adverse effects may be observed in our nonclinical studies causing us to delay or abandon clinical trials;
- clinical trials of our product candidates may produce unfavorable or inconclusive results;
- we, or our collaborators, may decide, or regulators may require us or them, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we, or our collaborators, anticipate, patient enrollment in these clinical trials may be slower than we, or our collaborators, anticipate or participants may drop out of these clinical trials at a higher rate than we, or our collaborators, anticipate;
- our third party contractors or those of our collaborators, including those manufacturing our product candidates or components or ingredients thereof or conducting clinical trials on our behalf or on behalf of our collaborators, may fail to comply with regulatory requirements or meet their contractual obligations to us or our collaborators in a timely manner or at all;
- regulators or institutional review boards may not authorize us, our collaborators or our or their investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we, or our collaborators, may have delays in reaching or fail to reach agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- patients that enroll in a clinical trial may misrepresent their eligibility to do so or may otherwise not comply with the clinical trial protocol, resulting in the need to drop the patients or the sites from the clinical trial, increase the needed enrollment size for the clinical trial, extend the clinical trial's duration or cause spurious results;

- investigators may provide inaccurate or false data, resulting in spurious clinical results, an inadequate data set or regulators' unwillingness to approve a product;
- regulators or institutional review boards may require that we, or our collaborators, or our or their investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or their standards of conduct, a finding that the participants are being exposed to unacceptable health risks, undesirable side effects or other unexpected characteristics of the product candidate or findings of undesirable effects caused by a chemically or mechanistically similar drug or drug candidate;
- the FDA or comparable foreign regulatory authorities may disagree with our or our collaborators' clinical trial design or our or their interpretation of data from nonclinical studies and clinical trials;
- the FDA or comparable foreign regulatory authorities may change their requirements for approvability for a given product or for an indication after we have initiated work based on their previous guidance;
- the supply or quality of raw materials or manufactured product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient, inadequate or not available at an acceptable cost, or we may experience interruptions in supply;
- we, or our manufacturing vendors, may not produce, or may not consistently produce material that meets necessary specifications for commercialization;
- the FDA or comparable foreign regulatory authorities may determine that our, or our manufacturing vendors, manufacturing or quality control processes fail to meet their specifications or guidelines; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient to obtain marketing approval.

Product development costs for us, or our collaborators, will increase if we, or they, experience delays in testing or pursuing marketing approvals and we, or they, may be required to obtain additional funds to complete clinical trials and prepare for possible commercialization of our product candidates. We, and our collaborators, do not know whether any nonclinical tests or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant nonclinical or clinical trial delays also could shorten any periods during which we, or our collaborators, may have the exclusive right to commercialize our product candidates or allow our competitors, or the competitors of our collaborators, to bring products to market before we, or our collaborators, do and impair our ability, or the ability of our collaborators, to successfully commercialize our product candidates and may harm our business and results of operations. In addition, many of the factors that cause, or lead to, clinical trial delays may ultimately lead to the denial of marketing approval of any of our product candidates.

If we, or our collaborators, experience delays or difficulties in the enrollment of patients in clinical trials, our, or their, receipt of necessary regulatory approvals could be delayed or prevented.

We, or our collaborators, may not be able to initiate or continue clinical trials for any of our product candidates if we, or they, are unable to locate and enroll a sufficient number of eligible patients to participate in clinical trials as required by the FDA or comparable foreign regulatory authorities, such as the European Medicines Agency. Patient enrollment is a significant factor in the timing of clinical trials, and is affected by many factors, including:

- the size and nature of the patient population;
- the severity of the disease under investigation;
- the proximity of patients to clinical sites;
- the eligibility criteria for the trial;
- the design of the clinical trial, including any requirement to halt current treatment in connection with the trial;
- access to relevant clinical trial sites;
- efforts to facilitate timely enrollment;
- competing clinical trials;
- support by relevant industry or patient organizations with influence over clinical trial sites; and
- clinicians' and patients' perceptions as to the potential advantages and risks of the drug being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating.

Our inability, or the inability of our collaborators, to enroll a sufficient number of patients for our, or their, clinical trials could result in significant delays or may require us or them to abandon one or more clinical trials altogether. Enrollment delays in our, or their, clinical trials may result in increased development costs for our product candidates, delay or halt the development of and approval processes for our product candidates and jeopardize our, or our collaborators', ability to commence sales of and generate revenues from our product candidates, which could cause the value of our Company to decline and limit our ability to obtain additional financing, if needed.

We, or our collaborators, may attempt to, and in some instances may be able to, secure clearances from the FDA or comparable foreign regulatory authorities to use expedited development pathways, including a 505(b)(2) regulatory pathway. However, if we or our collaborators are unable to obtain such clearances, we, or they, may be required to conduct additional nonclinical studies or clinical trials beyond those that we, or they, contemplate, which could increase the expense of obtaining, and/or delay the receipt of, necessary marketing approvals relative to an expedited pathway.

The deuterated compounds that we produce and seek to develop can have similar pharmacological properties as their corresponding non-deuterated compounds. Therefore, we believe that we, or our collaborators, may, in some instances, be able to obtain clearance from the FDA or comparable foreign regulatory authorities to follow expedited development programs for some deuterated compounds that reference and rely on findings previously obtained from prior nonclinical studies or clinical trials of the corresponding non-deuterated compounds. For example, the FDA has agreed that we will be able to develop CTP-656 as a monotherapy for certain cystic fibrosis patients under a 505(b)(2) regulatory pathway, using Kalydeco as the reference drug. This approach will allow us to rely on the established safety and efficacy of Kalydeco for our NDA, potentially decreasing the time and/or expense necessary to file the NDA. However, the extent to which we will be able to reference that data will be the subject of future negotiation with the FDA and will depend on data that is developed during our clinical and nonclinical development of CTP-656.

While we anticipate that following an expedited development pathway may be possible for some of our current and future product candidates, we cannot be certain that we, or our collaborators, will be able to secure clearance to follow such expedited development pathways on a regular basis from the FDA, or from comparable foreign regulatory authorities at all. In addition, if we follow, or one of our collaborators follows, such an expedited regulatory pathway and the FDA or comparable foreign regulatory authorities are not satisfied with the results of our having done so, such as might be the case if a deuterated compound is found to have undesirable side effects or other undesirable properties that were not anticipated based on the corresponding non-deuterated compound, the FDA or foreign regulatory authorities may be unwilling to grant clearance to follow expedited development pathways for other deuterated compounds.

In addition, emerging nonclinical or clinical data may indicate that reliance on data for the non-deuterated product can no longer be scientifically justified.

Consequently, we, or our collaborators, may be required to pursue full development programs with respect to any product candidates that we, or they, previously anticipated would be able to follow an expedited development pathway, including conducting a full range of nonclinical and clinical studies to attempt to establish the safety and efficacy of these product candidates. A need to conduct a full range of development activities would significantly increase the costs of development and length of time required before we, or our collaborators, could seek marketing approval of such a product candidate as compared to the costs and timing that we or they anticipate.

Serious adverse events, undesirable side effects or other unexpected properties of our product candidates, including those that we have licensed to collaborators, may be identified during development that could delay or prevent the product candidate's marketing approval.

All of our product candidates are in nonclinical and clinical development stages and their risk of failure is high. Serious adverse events or undesirable side effects caused by, or other unexpected properties of, our product candidates could cause us, one of our collaborators, an institutional review board or regulatory authorities to interrupt, delay or halt clinical trials of one or more of our product candidates and could result in a more restrictive label or the delay or denial of marketing approval by the FDA or comparable foreign regulatory authorities. A dose of a deuterated compound could, in comparison to an equal dose of the corresponding non-deuterated compound, result in altered exposure levels, distribution and half-life in the body and alter the levels of particular metabolites that are present in the body. These changes may cause serious adverse events or undesirable side effects that we or our collaborators did not anticipate, whether based on the characteristics of the corresponding non-deuterated compound or otherwise. If any of our product candidates is associated with serious adverse events or undesirable side effects or have properties that are unexpected, we, or our collaborators, may need to abandon development or limit development of that product candidate to certain uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. Many compounds that initially showed promise in clinical or earlier stage testing have later been found to cause undesirable or unexpected side effects that prevented further development of the compound. In addition, unexpected adverse clinical effects of a deuterated product candidate, including either those identified by us or deuterated analogs of approved drugs being developed by any third parties, may create general concerns regarding deuteration technology that could delay the development of our product candidates.

Even if one of our product candidates receives marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, third party payors and others in the medical community necessary for commercial success and the market opportunity for the product candidate may be smaller than we estimate.

Even if one of our product candidates, including those licensed to our collaborators, is approved by the appropriate regulatory authorities for marketing and sale, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, third party payors and others in the medical or patient communities. For example, physicians are often reluctant to switch their patients from existing therapies even when new and potentially more effective or convenient treatments enter the market. Further, patients often acclimate to the therapy that they are currently taking and do not want to switch unless their physicians recommend switching products or they are required to switch therapies due to lack of reimbursement for existing therapies. If any of our product candidates receive negative publicity, patients may choose not to request them even if approved, or may not comply with taking them as prescribed.

Efforts to educate the medical community and third party payors on the benefits of our product candidates may require significant resources and may not be successful. If any of our product candidates is approved but does not achieve an adequate level of market acceptance, we may not generate significant revenues and we may not become profitable. The degree of market acceptance of our product candidates, including those licensed to our collaborators, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy and safety of the product;
- the potential advantages of the product compared to alternative treatments;
- the prevalence and severity of any side effects;
- the clinical indications for which the product is approved;
- whether the product is designated under physician treatment guidelines as a first-line therapy or as a second- or third-line therapy;
- limitations or warnings, including distribution or use restrictions or burdensome prescription requirements contained in the product’s approved labeling;
- our ability, or the ability of our collaborators, to offer the product for sale at commercially acceptable prices;
- the product’s convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try, and of physicians to prescribe, the product;
- the strength of sales, marketing and distribution support;
- the approval of other new products for the same indications;
- the extent and success of counter-detailing efforts by our competitors;
- changes in the standard of care for the targeted indications for the product;
- the timing of market introduction of our approved products as well as competitive products; and
- availability and amount of reimbursement from government payors, managed care plans and other third party payors.

The potential market opportunities for our product candidates are difficult to precisely estimate. Our estimates of the potential market opportunities are predicated on many assumptions including industry knowledge and publications, third party research reports and other surveys. While we believe that our internal assumptions are reasonable, these assumptions involve the exercise of significant judgment on the part of our management, are inherently uncertain and the reasonableness of these assumptions has not been assessed by an independent source. If any of the assumptions proves to be inaccurate, the actual markets for our product candidates could be smaller than our estimates of the potential market opportunities.

If any of our product candidates receives marketing approval and we, or others, later discover that the drug is less effective than previously believed or causes undesirable side effects that were not previously identified, our ability to market the drug, or that of our collaborators, could be compromised.

Clinical trials of our product candidates are conducted in carefully defined subsets of patients who have agreed to enter into clinical trials. Consequently, it is possible that these individuals are not representative of the actual patient population or that our clinical trials may indicate an apparent positive effect of a product candidate that is greater than the actual positive effect, if any, or alternatively fail to identify undesirable side effects. If, following approval of a product candidate, we, or others, discover that the drug is less effective than previously believed or causes undesirable side effects that were not previously identified, any of the following adverse events could occur:

- regulatory authorities may withdraw their approval of the drug and/or seize the drug;
- we, or our collaborators, may be required to recall the drug or change the way the drug is administered;
- additional restrictions may be imposed on the marketing of, or the manufacturing processes for, the particular drug, including the addition of labeling statements, such as a “black box” warning or a contraindication;

- we may be subject to fines, injunctions or the imposition of civil or criminal penalties;
- we, or our collaborators, may be required to create a Medication Guide outlining the risks of the previously unidentified side effects for distribution to patients;
- we, or our collaborators, could be sued and held liable for harm caused to patients; and
- the drug may become less competitive.

Any of these events could have a material and adverse effect on our operations and business and could adversely impact our stock price.

If we are unable to establish sales, marketing and distribution capabilities or enter into sales, marketing and distribution arrangements with third parties, we may not be successful in commercializing any product candidates that we develop if and when those product candidates are approved.

We do not have a sales, marketing or distribution infrastructure and have no experience in the sale, marketing or distribution of pharmaceutical products. To achieve commercial success for any approved product, we must either develop a sales and marketing organization or outsource these functions to third parties. We expect to use a combination of third party collaboration, licensing and distribution arrangements and a focused in-house commercialization capability to sell any products that receive marketing approval.

We generally plan to seek to retain full commercialization rights for the United States for products that we can commercialize with a specialized sales force and to retain co-promotion or similar rights for the United States when feasible in indications requiring a larger commercial infrastructure. The development of sales, marketing and distribution capabilities will require substantial resources, will be time-consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing and distribution capabilities is delayed or does not occur for any reason, we could have prematurely or unnecessarily incurred these commercialization costs. This may be costly, and our investment could be lost if we cannot retain or reposition our sales and marketing personnel. In addition, we may not be able to hire or retain a sales force in the United States that is sufficient in size or has adequate expertise in the medical markets that we plan to target. If we are unable to establish or retain a sales force and marketing and distribution capabilities, our operating results may be adversely affected. If a potential partner has development or commercialization expertise that we believe is particularly relevant to one of our products, then we may seek to collaborate with that potential partner even if we believe we could otherwise develop and commercialize the product independently.

We currently expect to collaborate with third parties for commercialization in the United States of any products that require a large sales, marketing and product distribution infrastructure. We also expect to commercialize our product candidates outside the United States through collaboration, licensing and distribution arrangements with third parties. As a result of entering into arrangements with third parties to perform sales, marketing and distribution services, our product revenues or the profitability of these product revenues may be lower, perhaps substantially lower, than if we were to directly market and sell products in those markets. Furthermore, we may be unsuccessful in entering into the necessary arrangements with third parties or may be unable to do so on terms that are favorable to us. In addition, we may have little or no control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively.

If we do not establish sales and marketing capabilities, either on our own or in collaboration with third parties, we will not be successful in commercializing any of our product candidates that receive marketing approval.

We face substantial competition from other pharmaceutical and biotechnology companies and our operating results may suffer if we fail to compete effectively.

The development and commercialization of new drug products is highly competitive. We expect that we, and our collaborators, will face significant competition from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide with respect to our product candidates that we, or they, may seek to develop or commercialize in the future. Specifically, there are a number of large pharmaceutical and biotechnology companies that currently market and sell products or are pursuing the development of product candidates for the treatment of neurologic disorders, cystic fibrosis and inflammation, which are key indications for our development programs. Our competitors may succeed in developing, acquiring or licensing technologies and drug products that are more effective, simpler to use, have fewer or more tolerable side effects or are less costly than any product candidates that we are currently developing or that we may develop or acquire, which could render our product candidates obsolete and noncompetitive.

Avanir is developing AVP-786 for the treatment of agitation associated with Alzheimer's Disease and other neurologic or psychological disorders. There are competing marketed drugs and product candidates in clinical development for each indication. Intra-Cellular Therapies is developing a treatment for agitation in patients with dementia, including Alzheimer's Disease.

We are developing CTP-656 as a treatment for cystic fibrosis in patients with gating mutations. The current standard of care for the treatment of cystic fibrosis in patients who have gating mutations is ivacaftor, which is marketed by Vertex Pharmaceuticals, Inc. under the name Kalydeco®. If CTP-656 receives marketing approval, it would compete with Kalydeco and may face competition from a number of other product candidates that are currently in clinical development by AbbVie and Galapagos Pharmaceuticals, Flatley Labs, Novartis and Proteostasis, including additional candidates being developed by Vertex, among others.

We are developing CTP-543 as an oral agent for the treatment of moderate-to-severe alopecia areata. If CTP-543 receives marketing approval for this indication, it may face competition from a number of other product candidates that are being studied for alopecia areata. The non-deuterated analog of CTP-543, ruxolitinib, is being developed as a topical treatment for alopecia areata by Incyte, who markets ruxolitinib (Jakafi®) in the U.S. for myelofibrosis and polycythemia vera. Ruxolitinib is a Janus kinase, or JAK, inhibitor. A number of companies are pursuing development of JAK inhibitors with a range of subtype selectivities for the treatment of alopecia areata, including Incyte Corporation, Aclaris Therapeutics and Pfizer. Other groups, including Leo Pharma and various academic investigators, are conducting or have conducted efficacy trials in alopecia areata, including with currently approved JAK inhibitors such as ruxolitinib and tofacitinib (Xeljanz®).

JZP-386 is being developed for the treatment of excessive daytime sleepiness and cataplexy in patients with narcolepsy. The current standard of care is sodium oxybate. Avadel Pharmaceuticals is developing an extended release formulation of sodium oxybate for the treatment of narcolepsy. Roxane Laboratories, Inc. developed a generic version of Xyrem® for the treatment of narcolepsy, which was approved by the FDA in January 2017 but is not yet marketed pending ongoing litigation.

CTP-730 is a phosphodiesterase 4, or PDE4, inhibitor that has potential for the treatment of various inflammatory diseases. The non-deuterated drug apremilast is marketed for certain types of psoriasis and psoriatic arthritis. It is also being evaluated for efficacy in other chronic inflammatory diseases. If CTP-730 receives marketing approval, the competition it may face will depend on the particular inflammatory disease for which it receives approval.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we, or our collaborators, may develop. Our competitors also may obtain FDA or other marketing approval for their products before we, or our collaborators, are able to obtain approval for ours, which could reduce our ability to utilize expedited regulatory pathways and could result in our competitors establishing a strong market position before we, or our collaborators, are able to enter the market.

Many of our existing and potential future competitors have significantly greater financial resources and expertise in research and development, manufacturing, nonclinical testing, conducting clinical trials, obtaining marketing approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

We also face competition in the development of deuterated compounds.

Many pharmaceutical and biotechnology companies have begun to cover deuterated analogs of their product candidates in patent applications and may develop these deuterated compounds. Some of these pharmaceutical and biotechnology companies may have significantly greater financial resources and expertise in research and development, manufacturing, nonclinical testing, conducting clinical trials, obtaining marketing approvals and marketing approved products than we do. In addition, other companies are broadly utilizing deuterium substitution for drug development, including Teva Pharmaceutical Industries Ltd. and DeuteRx LLC. In some cases, these competitors may be interested in developing deuterated compounds that we may be interested in developing for ourselves. In addition, these competitors may enter into collaborative arrangements or business combinations that result in their ability to research and develop deuterated compounds more effectively than us. Our potential competitors also include academic institutions, government agencies and other public and private research organizations.

If our competitors in the development of deuterated compounds are able to grow their intellectual property estates and create new and successful deuterated compounds more effectively than us, our ability to identify additional compounds for nonclinical and clinical development and obtain product revenues in future periods could be compromised, which could result in significant harm to our operations and financial position.

If the FDA or comparable foreign regulatory authorities approve generic versions of any of our products that receive marketing approval, or such authorities do not grant our products appropriate periods of data exclusivity before approving generic versions of our products, the sales of our products could be adversely affected.

Once an NDA is approved, the product covered thereby becomes a "reference listed drug" in the FDA's publication, "Approved Drug Products with Therapeutic Equivalence Evaluations." Manufacturers may seek approval of generic versions of reference listed drugs through submission of abbreviated new drug applications, or ANDAs, in the United States. In support of an ANDA, a generic manufacturer need not conduct clinical studies. Rather, the applicant generally must show that its product has the same active ingredient(s), dosage form, strength, route of administration and conditions of use or labeling as the reference listed drug and that the generic version is bioequivalent to the reference listed drug, meaning it is absorbed in the body at the same rate and to the same extent. Generic products may be significantly less costly to bring to market than the reference listed drug and companies that produce generic products are generally able to offer them at lower prices. Thus, following the introduction of a generic drug, a significant percentage of the sales of any branded product or reference listed drug is typically lost to the generic product.

The FDA may not approve an ANDA for a generic product until any applicable period of non-patent exclusivity for the reference listed drug has expired. The Federal Food, Drug, and Cosmetic Act, or FDCA, provides a period of five years of non-patent exclusivity for a new drug containing a new chemical entity. Specifically, in cases where such 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 that a patent covering the reference listed drug is either invalid or will not be infringed by the generic product, in which case the applicant may submit its application four years following approval of the reference listed drug. While we believe that our product candidates contain active ingredients that would be treated as new chemical entities by the FDA and, therefore, if approved, should be afforded five years of data exclusivity, the FDA may disagree with that conclusion and may approve generic products after a period that is less than five years. Manufacturers may seek to launch these generic products following the expiration of the applicable marketing exclusivity period, even if we still have patent protection for our product.

Competition that our products may face from generic versions of our products could materially and adversely impact our future revenue, profitability and cash flows and substantially limit our ability to obtain a return on the investments we have made in those product candidates.

To the extent we, or our collaborators, market products that are deuterated analogs of generic drugs that are approved or will be approved while we market our products, our products may compete against these generic products and the sales of our products could be adversely affected.

We anticipate that some of the products that we, or our collaborators, may develop will be deuterated analogs of approved drugs that are or will then be available on a generic basis. In addition, if we develop a product that is a deuterated analog of a non-generic approved drug, the FDA or comparable foreign regulatory authorities may also approve generic versions of the corresponding non-deuterated drug. If approved, we expect that our deuterated products will compete against these generic non-deuterated compounds if they are used in the same indications. Even if the approved indications are different for the deuterated and non-deuterated drugs, the generic non-deuterated drug may be used off-label, negatively affecting sales of our product. Efforts to educate the medical community and third party payors on the benefits of any product that we develop as compared to the corresponding non-deuterated compound, or generic versions of it, may require significant resources and may not be successful. If physicians, rightly or wrongly, do not believe that a product that we, or our collaborators, develop offers substantial advantages over the corresponding non-deuterated compound, or generic versions of the corresponding non-deuterated compound, or that the advantages offered by our product as compared to the corresponding non-deuterated compound, or its generic versions, are not sufficient to merit the increased price over the corresponding non-deuterated compound, or its generic versions, that we, or our collaborators, would seek, physicians might not prescribe that product. In addition, third party payors may refuse to provide reimbursement for a product that we, or our collaborators, develop when the corresponding non-deuterated compound, or generic versions of the corresponding non-deuterated compound, offer a cheaper alternative therapy in the same indication, or may otherwise encourage use of the corresponding non-deuterated compound, or generic versions of the corresponding non-deuterated compound, over our product, even if our product possesses favorable pharmaceutical properties or is labeled for a different indication.

Competition that our product candidates may face from any generic non-deuterated product on which our product candidate is based or a later-approved generic version of a branded non-deuterated product on which our product is based, could materially and adversely impact our future revenue, profitability and cash flows and substantially limit our ability to obtain a return on the investments we have made in those product candidates.

If we develop a deuterated analog of a drug with orphan disease exclusivity, we may be prevented from marketing our compound prior to the expiration of that exclusivity unless we can show that the deuterated analog is not the same drug for the same indication or that it provides a large clinical advantage over the non-deuterated drug.

Under the Orphan Drug Act, if the FDA has granted a drug orphan disease exclusivity with respect to an orphan indication, which is generally defined as a disease or condition with a patient population of less than 200,000 patients in the United States annually, the FDA cannot approve a new drug application for the same drug and for the same orphan indication until the end of the exclusivity period of seven years following approval of the orphan drug unless the new product can demonstrate clinical superiority. If one of our deuterium-modified analogs is deemed by the FDA to be the same drug for the same indication as a corresponding non-deuterium modified drug that has orphan drug exclusivity, we may be prevented from marketing our drug during the exclusivity period.

Even if we, or our collaborators, are able to commercialize any product candidate that we, or they, develop, the product may become subject to unfavorable pricing regulations, third party payor reimbursement practices or healthcare reform initiatives that could harm our business.

The commercial success of our product candidates will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third party payors. Government authorities and third party payors, such as private health insurers and health maintenance organizations, decide which medications they will cover and establish reimbursement levels. The healthcare industry is acutely focused on cost containment, both in the United States and elsewhere. Government authorities and third party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications, which could affect our ability or that of our collaborators to sell our product candidates profitably. These payors may not view our products, if any, as cost-effective, and coverage and reimbursement may not be available to our customers, or those of our collaborators, or may not be sufficient to allow our products, if any, to be marketed on a competitive basis. Cost-control initiatives could cause us, or our collaborators, to decrease the price we, or they, might establish for products, which could result in lower than anticipated product revenues. If reimbursement is not available, or is available only to limited levels, we, or our collaborators, may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us, or our collaborators, to establish or maintain pricing sufficient to realize a sufficient return on our or their investments.

There is significant uncertainty related to third party payor coverage and reimbursement of newly approved drugs. Marketing approvals, pricing and reimbursement for new drug products vary widely from country to country. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we, or our collaborators, might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay commercial launch of the product, possibly for lengthy time periods, which may negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability or the ability of our collaborators to recoup our or their investment in one or more product candidates, even if our product candidates obtain marketing approval.

Third party payor coverage of newly approved drugs may be more limited than the indications for which the drugs are approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for reimbursement does not imply that any drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Reimbursement rates may vary, by way of example, according to the use of the drug and the clinical setting in which it is used. Reimbursement rates may also be based on reimbursement levels already set for lower cost drugs or may be incorporated into existing payments for other services.

In addition, increasingly, third party payors are requiring higher levels of evidence of the benefits and clinical outcomes of new technologies, requiring burdensome comparison studies with currently approved drugs and challenging the prices charged. We, and our collaborators, cannot be sure that coverage will be available for any product candidate that we, or they, commercialize and, if available, that the reimbursement rates will be adequate. Further, the net reimbursement for drug products may be subject to additional reductions if there are changes to laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. An inability to promptly obtain coverage and adequate payment rates from both government-funded and private payors for any our product candidates for which we, or our collaborators, obtain marketing approval could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

We may not be successful in our efforts to identify or discover additional potential product candidates.

A significant portion of our research involves the development of new deuterated compounds using our DCE Platform. These efforts may not be successful in creating compounds that have commercial value or therapeutic utility beyond the corresponding non-deuterated compound, or at all. Our research programs may initially show promise in creating potential product candidates, yet fail to yield viable product candidates for clinical development for a number of reasons, including:

- deuterated analogs of existing non-deuterated compounds or newly designed deuterated compounds may not demonstrate satisfactory efficacy or other benefits, such as convenience of dosing, increased tolerability, enhanced formation of desirable active metabolites or reduced formation of toxic metabolites;
- potential product candidates may, on further study, be shown to have harmful side effects or other characteristics that indicate that they are unlikely to be products that will receive marketing approval and achieve market acceptance; and
- pharmaceutical and biotechnology companies have begun to claim deuterated analogs of their compounds in patent filings, resulting in otherwise promising deuterated product candidates already being covered by patents or patent applications.

If we are unable to identify suitable additional compounds for nonclinical and clinical development, our ability to develop product candidates and obtain product revenues in future periods could be compromised, which could result in significant harm to our financial position and adversely impact our stock price.

Product liability lawsuits against us could divert our resources, cause us to incur substantial liabilities and limit commercialization of any products that we may develop.

We face an inherent risk of product liability claims as a result of the clinical testing of our product candidates despite obtaining appropriate informed consents from our clinical trial participants. We will face an even greater risk if we or our collaborators commercially sell any product that we may or they may develop. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our product candidates or products that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend litigation;
- distraction to our management diverting focus from business operations and strategy;
- initiation of investigations by regulators;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize any products that we may develop.

Although we maintain product liability insurance coverage, it may not fully cover potential liabilities that we may incur. The cost of any product liability litigation or other proceeding, even if resolved in our favor, could be substantial. We will need to increase our insurance coverage if and when we begin selling any product candidate that receives marketing approval. In addition, insurance coverage is becoming increasingly expensive. If we are unable to obtain or maintain sufficient insurance coverage at an acceptable cost or to otherwise protect against potential product liability claims, it could prevent or inhibit the development and commercial production and sale of our product candidates, which could adversely affect our business, financial condition, results of operations and prospects.

JZP-386 is a deuterated analog of a Schedule I controlled substance and the active pharmaceutical ingredient will likely be classified as a Schedule I controlled substance and the drug product will likely be classified as a Schedule III controlled substance, which could substantially limit our, or our collaborator's, ability to obtain the quantities of JZP-386 needed to conduct clinical trials and the ability of our collaborator to market and sell JZP-386 if it receives marketing approval.

The placement of drugs or other substances into schedules under the Controlled Substances Act of 1970, or CSA, is based upon the substance's medical use, potential for abuse and safety or dependence liability. Under the CSA, every person who manufactures, distributes, dispenses, imports or exports any controlled substance must register with the U.S. Drug Enforcement

Agency, or DEA, unless exempt. Our product candidate JZP-386, which we have licensed to Jazz Pharmaceuticals, is a deuterated sodium oxybate analog. Sodium oxybate is regulated as a chemical by the DEA as a Schedule I controlled substance. Because of the Schedule I classification of sodium oxybate, JZP-386 is regulated by the DEA as a Schedule I controlled substance. As a result, we or Jazz Pharmaceuticals will be required to obtain a license to ship the chemical intermediate that we are using as the precursor to JZP-386, which may delay or prevent the manufacturing of JZP-386 for clinical trials.

Specifically, the DEA limits the quantity of certain Schedule I controlled substances that may be produced in the United States in any year through a quota system. If our contract manufacturers for JZP-386, or those for Jazz Pharmaceuticals, manufacture JZP-386 in the United States, they will be required to obtain separate DEA quotas to supply us or Jazz Pharmaceuticals with JZP-386 for the conduct of clinical trials. Different, but potentially no less burdensome regulations, may apply if we or Jazz Pharmaceuticals choose to contract for the manufacture of JZP-386 outside of the United States.

The process of obtaining the quotas needed to conduct the planned clinical trials of JZP-386 may involve lengthy legal and other efforts and we or Jazz Pharmaceuticals, or suppliers or manufacturers for us or Jazz Pharmaceuticals, may not be able to obtain sufficient quotas from the DEA. If we or Jazz Pharmaceuticals, or suppliers or manufacturers for us or Jazz Pharmaceuticals, cannot obtain the quotas that are needed on a timely basis, or at all, we and Jazz Pharmaceuticals may not be able to conduct, on a timely basis or at all, the clinical trials of JZP-386 that are planned, and our business, financial condition, results of operations and growth prospects could be adversely affected.

If JZP-386 is approved for marketing in the United States, we believe that the commercial drug containing JZP-386 will remain subject to the CSA as a Schedule III controlled substance. Those restrictions could limit the marketing and distribution of the commercial drug containing JZP-386.

In addition, failure to maintain compliance with applicable requirements under the CSA, particularly as manifested in loss or diversion of regulated substances, can result in enforcement action that could include civil penalties, refusal to renew registrations or quotas, revocation of registrations or quotas or criminal proceedings, any of which could have a material adverse effect on our business, results of operations and financial condition. Individual states also regulate controlled substances, and we and Jazz Pharmaceuticals, and contract manufacturers for us and Jazz Pharmaceuticals, will be subject to state regulation on distribution of these products.

RISKS RELATED TO OUR DEPENDENCE ON THIRD PARTIES

We depend on collaborations with third parties for the development and commercialization of some of our product candidates and expect to continue to do so in the future. Our prospects with respect to those product candidates will depend in significant part on the success of those collaborations.

We have entered into collaborations with Avanir, Celgene and Jazz Pharmaceuticals for the development and commercialization of certain of our product candidates and expect to enter into additional collaborations in the future. We have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates and our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. In addition, our collaborators have the right to abandon research or development projects and terminate applicable agreements, including funding obligations, prior to or upon the expiration of the agreed upon terms.

Collaborations involving our product candidates pose a number of risks, including:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs, based on clinical trial results, changes in the collaborators' strategic focus or available funding or external factors, such as an acquisition, that divert resources or create competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
- product candidates developed in collaboration with us, including in particular product candidates based on deuteration of a collaborator's marketed drugs or advanced clinical candidates, may be viewed by our collaborators as competitive with

their own product candidates or products, which may cause collaborators to cease to devote resources to the commercialization of our product candidates;

- a collaborator with marketing and distribution rights to one or more products may not commit sufficient resources to the marketing and distribution of such product or products;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the preferred course of development, might cause delays or termination of the research, development or commercialization of product candidates, might lead to additional responsibilities for us with respect to product candidates, or might result in litigation or arbitration, any of which would be time-consuming and expensive;
- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential litigation;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability; and
- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.

Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. If a collaborator of ours is involved in a business combination, it could decide to delay, diminish or terminate the development or commercialization of any product candidate licensed to it by us.

We expect to 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.

Our drug development programs and the potential commercialization of our product candidates will require substantial additional cash to fund expenses. We are seeking collaborators who have product candidates that are correctors or other modulators of the cystic fibrosis transmembrane conductance receptor protein, or CFTR, in order to develop combination products with CTP-656. Combining CTP-656 with a CFTR corrector or other modulator may be necessary to effectively treat the majority of patients with cystic fibrosis. We are also seeking a collaborator for CTP-499, and we may seek one or more collaborators for the development and commercialization of one or more of our product candidates. We do not currently intend to conduct further clinical development of CTP-499 for the treatment of diabetic nephropathy absent such a collaboration.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for collaboration will depend, among other things, upon our assessment of the collaborator’s resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator’s evaluation of a number of factors. Those factors may include the potential differentiation of our product candidate from its corresponding non-deuterated analog, design or results of clinical trials, the likelihood of approval by the FDA or comparable foreign regulatory authorities and the regulatory pathway for any such approval, the potential market for the product candidate, the proposed collaborator’s perception of our freedom to operate in a particular market or markets without challenge, the costs and complexities of manufacturing and delivering the product to patients and the potential of competing products. The collaborator may also consider alternative product candidates or technologies that may be available for collaboration and whether such collaboration could be more attractive than the one with us for our product candidate.

Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators. We are also restricted under the terms of certain of our existing collaboration agreements from entering into collaborations regarding or otherwise developing specified compounds that are similar to the compounds that are subject to those agreements and collaboration agreements that we enter into in the future may contain further restrictions on our ability to enter into potential collaborations or to otherwise develop specified compounds.

We may not be able to negotiate collaborations for our product candidates on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to limit the development of the product candidate for which we are seeking to collaborate, reduce or delay its development program or one or more 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 develop our product candidates or bring them to market and generate product revenue. In cases where we seek a collaborator for a product compound that is a deuterated analog of a compound that has been previously developed, failure to enter into a collaboration with the developer of the corresponding non-deuterated compound may result in a loss of the potential to obtain clearance from the FDA to follow expedited development programs that reference and rely on findings previously obtained from the developer's prior nonclinical or clinical studies of the corresponding non-deuterated compound.

We rely on third parties to conduct our clinical trials and some aspects of our research and nonclinical testing. If they terminate their relationships with us or do not perform satisfactorily, our business may be materially harmed.

We do not independently conduct clinical trials of any of our product candidates. We rely on third parties, such as contract research organizations, clinical data management organizations, medical institutions and clinical investigators, to conduct these clinical trials and expect to rely on these third parties to conduct clinical trials of any other product candidate that we develop. We also rely on third parties to conduct some aspects of our research and nonclinical testing and expect to rely on these third parties in the future. Any of these third parties may terminate their engagements with us under certain circumstances. If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties on commercially reasonable terms, or at all. Switching to or adding additional third parties would involve additional cost and require management time and focus. In addition, there is a natural transition period when a new third party commences work, which could result in delays in our product development activities. Although we seek to carefully manage our relationships with our contract research organizations, any such challenges or delays could have a material adverse impact on our business, financial condition and prospects.

Our reliance on these third parties for clinical development activities limits our control over these activities but we remain responsible for ensuring that each of our studies is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards. For example, notwithstanding the obligations of a contract research organization for a trial of one of our product candidates, we remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with standards, commonly referred to as current Good Clinical Practices, or GCPs, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. The FDA enforces these GCPs through periodic inspections of trial sponsors, principal investigators, clinical trial sites and institutional review boards. If we or our third party contractors fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA may require us to perform additional clinical trials before approving our product candidates, which would delay the marketing approval process. We cannot be certain that, upon inspection, the FDA will determine that any of our clinical trials comply with GCPs.

Furthermore, these third parties are not our employees, and except for remedies available to us under our agreements with such contractors, we cannot control whether or not they devote sufficient time, skill and resources to our ongoing development programs. These contractors may also have relationships with other commercial entities, including our competitors, which could impede their ability to devote appropriate time to our clinical programs. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct their services in accordance with our contracts, regulatory requirements or our stated protocols, we may not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates. If that occurs, we will not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates. In such an event, our financial results and the commercial prospects for any product candidates that we seek to develop could be harmed, our costs could increase and our ability to generate revenues could be delayed, impaired or foreclosed.

We also rely on other third parties to store, label 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 any resulting products, producing additional losses and depriving us of potential product revenue.

We are also required to register clinical trials and post the results of completed clinical trials on a government-sponsored database, such as ClinicalTrials.gov, within certain timeframes. Failure to do so can result in the inability to report our clinical results in certain publications, fines, adverse publicity and civil and criminal sanctions.

Because there are limited sources of deuterium, we, and our collaborators, are exposed to a number of risks and uncertainties associated with our deuterium supply.

We believe that all of the deuterium that we use in manufacturing our product candidates is currently derived, directly or indirectly, from deuterium oxide. For most of our deuterium supply, we rely on bulk supplies of deuterium oxide which we currently source from multiple suppliers, including two located in North America, one of which is in the United States.

In order to internationally transport any deuterium oxide that we purchase from our current or potential future foreign suppliers, we, or our suppliers, may be required to obtain an export license from the country of origin and we may be required to obtain an International Import Certificate or other governmental approvals or assurances from the country of destination. We are also required to obtain an export license from the Nuclear Regulatory Commission before shipping deuterium oxide from the United States to any contract manufacturer in another country. Export licenses and certain other required documents may specify the maximum amount of deuterium oxide that we, or our suppliers, are permitted to either import or export. In order for us to obtain supplies of deuterium oxide from foreign suppliers, they may be required to obtain an export license from the country of origin and we may be required to obtain domestic governmental approvals or assurances. In addition, our current U.S. export licenses may be insufficient to meet our future requirements. We, or our suppliers, may not be able to obtain such licenses, approvals or assurances in a timely manner or at all.

Certain of our manufacturing processes for our product candidates incorporate deuterium by using deuterated chemical intermediates or reagents that are derived from deuterium oxide. For the deuterated chemical intermediates and reagents, we are not subject to the license requirements applicable to deuterium oxide; however the manufacturer of the deuterated chemical intermediate or reagent may themselves be required to obtain deuterium oxide under applicable licensing requirements. Most of the manufacturers of these deuterated chemical intermediates and reagents are not located in countries that produce bulk quantities of deuterium oxide. Therefore, our ability to source these deuterated chemical intermediates will depend on the ability of these manufacturers to obtain deuterium oxide from other countries. In the future we may arrange for supplies of deuterated chemical intermediates or reagents from manufacturers located in countries from which they can source deuterium oxide in bulk. However, contract manufacturers in these countries may not represent a viable alternative to our current suppliers. We do not have long-term agreements with our suppliers of deuterated chemical intermediates or reagents and we obtain some of these deuterated chemical intermediates or reagents from single sources, putting us at risk of uncontrolled cost increases or supply interruptions if we cannot establish alternative sourcing arrangements. Deuterated chemical intermediates may be expensive or difficult to obtain or may be produced by specialized techniques that are not widely practiced and we may not be able to enter into arrangements for larger scale supply of deuterated chemical intermediates on acceptable terms, or at all.

We estimate that our current sources of deuterium oxide will be sufficient to meet our anticipated requirements; however, we do not have long-term agreements with our current suppliers. If we are not able to establish or maintain supply arrangements, or any relevant foreign governments decide to withhold authorizations for the export of deuterium oxide that we seek, we may be unable to secure alternative sources. If we are unable to obtain sufficient supplies of deuterium oxide from our current suppliers or our potential future foreign supplier, we would be forced to either seek alternative suppliers of deuterium oxide, likely in other countries, or alternative sources of deuterium. Such alternative supplies may not be available to us on acceptable terms, or at all.

If we are unable to obtain sufficient supplies of deuterium, our ability to produce our product candidates would be impeded and our business, financial condition and prospects could be harmed. In particular, certain of our manufacturing processes are projected to require particularly large quantities of deuterium for late-stage clinical trials and for commercialization. Consequently, any adverse impact on our ability to obtain deuterium oxide from our current suppliers, import deuterium oxide into the United States or export deuterium oxide to our contract manufacturers could have a particularly severe impact on our ability to develop or commercialize those product candidates.

Similarly, to develop and commercialize any of our licensed product candidates, our collaborators will need to obtain supplies of deuterium and will be subject to risks and requirements in connection with sourcing deuterium that are similar to the ones that we face. In addition, if any of our product candidates is approved by the FDA, then the FDA will also have regulatory jurisdiction over the manufacture and use of deuterium oxide and deuterated chemical intermediates or reagents in such products. Any adverse impact on our, or our collaborators', ability to obtain deuterium could delay or prevent the development or commercialization of our product candidates, which could have a material adverse effect on our business.

We contract with third parties for the manufacture and distribution of our product candidates for nonclinical and clinical testing and expect to continue to do so in connection with our future development and commercialization efforts. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We currently rely, and expect to continue to rely, on third party contractors to manufacture nonclinical and clinical supplies of our product candidates and to package, label and ship these supplies. We expect to rely on third party contractors to manufacture, formulate, package, label and distribute commercial quantities of any product candidate that we commercialize following approval for marketing by applicable regulatory authorities. Reliance on such third party contractors entails risks, including:

- manufacturing delays if our third party contractors give greater priority to the supply of other products over our product candidates or otherwise do not satisfactorily perform according to the terms of the agreements between us and them;
- the possible termination or nonrenewal of agreements by our third party contractors at a time that is costly or inconvenient for us;
- potentially limited numbers of available contractors due to the need for uncommon equipment or expertise, or pre-existing conflicts of interest;
- the possible breach by the third party contractors of our agreements with them;
- possible theft of intellectual property or trade secrets;
- possible theft of our materials, including starting materials, intermediates, active pharmaceutical ingredients, or drug products;
- the failure of third party contractors to comply with applicable regulatory requirements;
- the possible mislabeling of clinical supplies, potentially resulting in the wrong dose amounts being supplied or active drug or placebo not being properly identified;
- possible contamination of our product during or after its manufacture;
- possible interruptions in our contractors' operations, including departure of key personnel, disruption due to merger and acquisitions activities or supply chain disruptions;
- the possibility of clinical supplies not being delivered to clinical sites on time, leading to clinical trial interruptions, or of drug supplies not being distributed to commercial vendors in a timely manner, resulting in lost sales; and
- the possible misappropriation of our proprietary information, including our trade secrets and know-how.

If any of our product candidates are approved by any regulatory agency, we plan to enter into agreements with third party contract manufacturers for the commercial production and distribution of those products. It may be difficult for us to reach agreement with a contract manufacturer on satisfactory terms or in a timely manner, especially if the manufacturer believes it is uniquely suited to use our deuterium chemistry manufacturing processes or otherwise has unusual market power, or that our deuterium chemistry manufacturing processes bear greater production risks than manufacture of non-deuterated compounds. In addition, we may face competition for access to manufacturing facilities as there are a limited number of contract manufacturers operating under current good manufacturing practices, or cGMPs, that are capable of manufacturing our product candidates. Consequently, we may not be able to reach agreement with third party manufacturers on satisfactory terms, which could delay our commercialization efforts.

Third party manufacturers are required to comply with cGMPs and similar regulatory requirements outside the United States. Facilities used by our third party manufacturers must be approved by the FDA after we submit an NDA and before potential approval of the product candidate. Similar regulations apply to manufacturers of our product candidates for use or sale in foreign countries. We do not directly control the manufacturing process and are completely dependent on our third party manufacturers for compliance with the applicable regulatory requirements for the manufacture of our product candidates. If our manufacturers fail to consistently manufacture material that conforms to the strict regulatory requirements of the FDA and any applicable foreign regulatory authority, they will not be able to secure the applicable approval for their manufacturing facilities. If these facilities are not approved for commercial manufacture, we may need to find alternative manufacturing facilities, which could result in delays in obtaining approval for the applicable product candidate.

In addition, our manufacturers are subject to ongoing periodic inspections by the FDA and corresponding state and foreign agencies for compliance with cGMPs and similar regulatory requirements both prior to and following the receipt of marketing approval for any of our product candidates. Some of these inspections may be unannounced. Failure by any of our manufacturers to comply with applicable cGMPs or other regulatory requirements could result in sanctions being imposed on us, including fines, injunctions, civil penalties, delays, suspensions or withdrawals of approvals, operating restrictions, interruptions in supply and criminal prosecutions, any of which could significantly and adversely affect supplies of our product candidates and have a material adverse impact on our business, financial condition and results of operations.

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

RISKS RELATED TO OUR INTELLECTUAL PROPERTY

If we are unable to obtain and maintain sufficient patent protection for our product candidates, or if the scope of the patent protection is not sufficiently broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our product candidates may be adversely affected.

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our proprietary product candidates. If we do not adequately protect our intellectual property, competitors may be able to erode or negate any competitive advantage we may have, which could harm our business and ability to achieve profitability. To protect our proprietary position, we file patent applications in the United States and abroad related to our novel product candidates that are important to our business. The patent application and approval process is expensive, uncertain and time-consuming. We may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. Neither deuterium itself, nor the general concept of selective substitution of deuterium for hydrogen in existing pharmaceutical compounds, is patentable; therefore we usually seek patents on a compound-by-compound basis or on a relatively narrow genus of compounds. We are not guaranteed that patents will issue protecting any particular deuterated compound for which we seek patent protection. We also cannot guarantee that another company will not be able to find a different pattern of deuterium substitution that is equally or more effective in improving the characteristics of a non-deuterated compound, then patenting that deuterated compound and competing with us.

Our ability to obtain and maintain patent protection for our product candidates may be limited if disclosures of non-deuterated compounds are held to anticipate or make obvious claims of deuterated analogs of the same or similar compounds in any given territory. In addition, several large pharmaceutical and biotechnology companies have begun to pursue patent protection for deuterated analogs of their products and product candidates, and may in the future obtain patent protection that covers deuterated analogs of those product candidates. If patents directed primarily to non-deuterated compounds are deemed to protect deuterated analogs of those compounds or patent claims on deuterated analogs of compounds become common in the biotechnology and pharmaceutical industries, these factors may limit, in part or in whole, our ability to seek and obtain patent protection for new product candidates based on deuterium modification of compounds. It may also limit in part or in whole, our ability to develop new product candidates based on deuterium modification of such compounds without obtaining a license from those patent holders.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain. No consistent policy regarding the breadth of claims allowed in biotechnology and pharmaceutical patents has emerged to date in the United States or in many foreign jurisdictions. In addition, the determination of patent rights with respect to pharmaceutical compounds commonly involves complex legal and factual questions, which has in recent years been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain.

Assuming the other requirements for patentability are met, currently, the first to file a patent application is generally entitled to the patent. However, prior to March 16, 2013, in the United States, the first to invent was entitled to the patent. 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. Therefore we cannot be certain that 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, we may be subject to a third party preissuance submission of prior art to the U.S. Patent and Trademark Office, or become involved in opposition, derivation, reexamination, post grant review, inter partes review or interference proceedings, in the United States or elsewhere, challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or product candidates and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third party patent rights.

Our pending and future patent applications may not result in patents being issued which protect our product candidates, in whole or in part, or which effectively prevent others from commercializing competitive products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. In addition, the laws of foreign countries may not protect our rights to the same extent or in the same manner as the laws of the United States. For example, European patent law restricts the patentability of methods of treatment of the human body more than United States law does.

Even if our patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner. Our competitors may also seek approval to market their own products similar to or otherwise competitive with our products. Alternatively, our competitors may seek to market generic versions of any approved products by submitting ANDAs to the FDA in which they claim that patents owned or licensed by us are invalid, unenforceable or not infringed. In these circumstances, we may need to defend or assert our patents, or both, including by filing lawsuits alleging patent infringement. In any of these types of proceedings, a court or other agency with jurisdiction may find our patents invalid or unenforceable, or that our competitors are competing in a non-infringing manner. In certain territories, losses to an infringing product may not be sufficiently great to justify the costs of challenging the infringer and asserting our rights. In some situations, governments have allowed or enabled the sale of competing products that infringe a company's intellectual property. Thus, even if we have valid and nominally enforceable patents, these patents still may not provide protection against competing products or processes sufficient to achieve our business objectives.

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 in the courts or patent offices in the United States and abroad, including challenges through the U.S. Patent and Trademark Office post-grant review procedures. Such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. In addition, given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized.

If we are unable to protect the confidentiality of our trade secrets, the value of our technology could be materially adversely affected and our business would be harmed.

While we have obtained composition of matter patents with respect to our most advanced product candidates, our DCE Platform is not patented. In seeking to develop and maintain a competitive position through our DCE Platform and as to other aspects of our business, we rely on trade secrets, including unpatented know-how, technology and other proprietary information. We seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our consultants, independent contractors, advisors, corporate collaborators, outside scientific collaborators, contract manufacturers, suppliers and other third parties. We also enter into confidentiality and invention or patent assignment agreements with employees and certain consultants. Any party with whom we have executed such an agreement may breach that agreement and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, if any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such third party, or those to whom they communicate such technology or information, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our business and competitive position could be harmed.

Third parties may sue us alleging that we are infringing their intellectual property rights, and such litigation could be costly and time consuming and could prevent or delay us from developing or commercializing our product candidates.

Our commercial success depends, in part, on our ability to develop, manufacture, market and sell our product candidates without infringing the intellectual property and other proprietary rights of third parties. Some of our current and future product candidates are based on products that are covered by issued patents or patent applications, the holders of which may attempt to assert claims against us. To date, we are not aware of any judicial decision holding that a patent that covers a non-deuterated compound should be construed to also cover deuterated analogs thereof, absent specific claims with respect to the deuterated analogs. However, any such judicial decision, or legal proceedings asserting such claims, could increase the likelihood of potential infringement claims being asserted against us. If any third party patents or patent applications are found to cover our product candidates or their methods of use, we may not be free to manufacture or market our product candidates as planned without obtaining a license, which may not be available on commercially reasonable terms, or at all.

For example, CTP-656 is a deuterium-modified version of ivacaftor and CTP-543 is a deuterium-modified version of ruxolitinib. Ivacaftor is marketed by Vertex under the name Kalydeco and ruxolitinib is marketed in the U.S. by Incyte under the name Jakafi. Vertex currently has patents covering ivacaftor that may be unexpired if and when we seek marketing approval for CTP-656, and Incyte has patents covering ruxolitinib that may be unexpired if and when we seek marketing approval for CTP-543. In addition, Columbia University is the assignee of a patent claiming the use of ruxolitinib for the treatment of hair loss disorders, including alopecia areata, which may be unexpired if and when we seek marketing approval for CTP-543. If we have to defend ourselves in a patent infringement suit, we may incur significant expenses in doing so. Such litigation could delay our ability to market, or prevent us from marketing, CTP-656 or CTP-543.

There is a substantial amount of intellectual property litigation in the biotechnology and pharmaceutical industries, and we may become party to, or threatened with, litigation or other adversarial proceedings regarding intellectual property rights with respect to our products candidates, including interference proceedings before the U.S. Patent and Trademark Office. Third parties may assert infringement claims against us based on existing or future intellectual property rights. The outcome of intellectual property litigation is subject to uncertainties that cannot be adequately quantified in advance. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. If we are sued for patent infringement, we would need to demonstrate that our product candidates, products or methods either do not infringe the relevant patent claims or that these patent claims are invalid or unenforceable, and we may not be able to do this. Proving invalidity is difficult. For example, in the United States, proving invalidity under most circumstances requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents. We may also assert that a patent claim for a corresponding non-deuterated compound does not cover our product. Even if we are successful in these proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted in pursuing these proceedings, which could have a material adverse effect on us. In addition, we may not have sufficient resources to bring these actions to a successful conclusion.

If we are found to infringe a third party's intellectual property rights, we could be forced, including by court order, to cease developing, manufacturing or commercializing the infringing product candidate or product and could be required to pay potentially significant damages. Alternatively, we may be required to obtain a license from such third party in order to use the infringing technology and continue developing, manufacturing or marketing the infringing product candidate. However, we may not be able to obtain any required license on commercially reasonable terms, or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

We may become involved in lawsuits to protect or enforce our patents or other intellectual property, which could be expensive, time consuming and unsuccessful.

Competitors may infringe our patents, trademarks, copyrights or other intellectual property. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming and divert the time and attention of our management and scientific personnel. In any patent infringement proceeding, there is a risk that a court will decide that a patent of ours is invalid or unenforceable, in whole or in part, and that we do not have the right to stop the other party from using the invention at issue. There is also a risk that, even if the validity and enforceability of such patents is upheld, the court will construe the patent's claims narrowly or decide that we do not have the right to stop the other party from using the invention at issue on the grounds that our patent claims do not cover the invention. An adverse outcome in a litigation or proceeding involving our patents could limit our ability to assert our patents against those parties or other competitors, and may curtail or preclude our ability to exclude third parties from making and selling similar or competitive products. Any of these occurrences could adversely affect our competitive business position, business prospects and financial condition.

Even if we establish infringement, the court may decide not to grant an injunction against further infringing activity and instead award only monetary damages, which may or may not be an adequate remedy. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during litigation. Moreover, there can be no assurance that we will have sufficient financial or other resources to file and pursue such infringement claims, which typically last for years before they are concluded. Even if we ultimately prevail in such claims, the monetary cost of such litigation and the diversion of the attention of our management and scientific personnel could outweigh any benefit we receive as a result of the proceedings.

RISKS RELATED TO REGULATORY APPROVAL AND OTHER LEGAL COMPLIANCE MATTERS

Even if we complete the necessary nonclinical studies and clinical trials the marketing approval process is expensive, time consuming and uncertain and we may not obtain approvals for the commercialization of some or all of our product candidates. As a result, we cannot predict when or if, and in which territories, we, or our collaborators, will obtain marketing approval to commercialize a product candidate.

The research, testing, manufacturing, labeling, approval, selling, marketing, promotion and distribution of drug products are subject to extensive regulation by the FDA and comparable foreign regulatory authorities, which regulations differ from country to country. Failure to obtain marketing approval for a product candidate in a given territory will prevent us and our collaborators from commercializing the product candidate in that territory. Our product candidates are in various stages of development and are subject to the risks of failure inherent in drug development. We, and our collaborators, have not submitted an application for or received marketing approval for any of our product candidates in the United States or in any other jurisdiction. We have limited experience in filing and supporting the applications necessary to gain marketing approvals.

The process of obtaining marketing approvals, both in the United States and abroad, is lengthy, expensive and uncertain. It may take many years, if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. This is the case even though the deuterated compounds that we produce and seek to develop can have similar pharmacological properties as their corresponding non-deuterated compounds. Even if, as a result of any such similarities, we, or our collaborators, obtain clearance from the FDA and other regulatory authorities to follow expedited development programs for some deuterated compounds that reference and rely on previous findings for non-deuterated compounds, the review and approval of our product candidates may still take a substantial period of time.

In addition, changes in marketing approval policies during the development period, changes in or the enactment or promulgation of additional statutes, regulations or guidance or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. Regulatory authorities have substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional nonclinical, clinical or other studies. In addition, varying interpretations of the data obtained from nonclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we, or our collaborators, ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

Any delay in obtaining or failure to obtain required approvals could materially adversely affect our ability or that of our collaborators to generate revenue from the particular product candidate, which likely would result in significant harm to our financial position and adversely impact our stock price.

Failure to obtain marketing approval in international jurisdictions would prevent our product candidates from being marketed abroad.

In order to market and sell our products in the European Union and many other jurisdictions, we, or our collaborators, must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The marketing approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many territories outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that territory. Our products may not receive commercially feasible prices in any given territory, or the price offered for our products in a territory may have an adverse effect on their prices in other territories if we were to accept. We, and our collaborators, may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA.

Even if we, or our collaborators, obtain marketing approvals for our product candidates, the terms of approvals and ongoing regulation of our products may limit how we, or they, manufacture and market our products, which could materially impair our ability to generate revenue.

Once marketing approval has been granted, an approved product and its manufacturer and marketer are subject to ongoing review and extensive regulation. We, and our collaborators, must therefore comply with requirements concerning advertising and promotion for any of our product candidates for which we or they obtain marketing approval. Promotional communications with respect to prescription drugs are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved labeling. Thus, we and our collaborators will not be able to promote any products we develop for indications or uses for which they are not approved.

In addition, manufacturers of approved products and those manufacturers' facilities are required to comply with extensive FDA requirements, including ensuring that quality control and manufacturing procedures conform to cGMPs, which include requirements relating to quality control and quality assurance as well as the corresponding maintenance of records and documentation and reporting requirements. We, our contract manufacturers, our collaborators and their contract manufacturers could be subject to periodic unannounced inspections by the FDA to monitor and ensure compliance with cGMPs.

Accordingly, assuming we, or our collaborators, receive marketing approval for one or more of our product candidates, we, and our collaborators, and our and their contract manufacturers will continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production, product surveillance and quality control.

If we, and our collaborators, are not able to comply with post-approval regulatory requirements, we, and our collaborators, could have the marketing approvals for our products withdrawn by regulatory authorities and our, or our collaborators', ability to market any future products could be limited, which could adversely affect our ability to achieve or sustain profitability. Further, the cost of compliance with post-approval regulations may have a negative effect on our operating results and financial condition.

Any of our product candidates for which we, or our collaborators, obtain marketing approval in the future could be subject to post-marketing restrictions or withdrawal from the market and we, or our collaborators, may be subject to substantial penalties if we, or they, fail to comply with regulatory requirements or if we, or they, experience unanticipated problems with our products following approval.

Any of our product candidates for which we, or our collaborators, obtain marketing approval in the future, as well as the manufacturing processes, post-approval studies and measures, labeling, advertising and promotional activities for such product, among other things, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to the conditions of approval, including the requirement to implement a Risk Evaluation and Mitigation Strategy, or REMS.

The FDA may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of a product. The FDA and other agencies, including the Department of Justice, closely regulate and monitor the post-approval marketing and promotion of products to ensure that they are manufactured, marketed and distributed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and if we, or our collaborators, do not market any of our product candidates for which we, or they, receive marketing approval for only their approved indications, we, or they, may be subject to warnings or enforcement action for off-label marketing. Violation of the FDCA and other statutes, including the False Claims Act, relating to the promotion and advertising of prescription drugs may lead to investigations or allegations of violations of federal and state health care fraud and abuse laws and state consumer protection laws.

In addition, later discovery of previously unknown adverse events or other problems with our products or their manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on such products, manufacturers or manufacturing processes;
- restrictions on the indication, patient population, or other parameters for which the drug is approved;
- restrictions on the labeling or marketing of a product;
- restrictions on product distribution or use;
- requirements to conduct post-marketing studies or clinical trials;
- warning letters or untitled letters;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of products;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;

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

Recently enacted and future legislation may increase the difficulty and cost for us and our collaborators to obtain marketing approval of and commercialize our product candidates and affect the prices we, or they, may obtain.

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, or the ability of our collaborators, to profitably sell any products for which we, or they, obtain marketing approval.

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 any approved products. While the MMA only addresses 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 Affordability Reconciliation Act, or collectively the PPACA.

Among the provisions of the PPACA of potential importance to our product candidates 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 False Claims Act and the 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 50% 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 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 have been proposed and adopted since the PPACA was enacted. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, starting in 2013. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several 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.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA regulations, guidance or interpretations will be changed, or what the impact of such changes on the marketing approvals of our product candidates, if any, may be. In addition, increased scrutiny by the United States Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us and our collaborators to more stringent product labeling and post-marketing testing and other requirements.

Our future relationships with customers and third party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, physicians and third party payors will play a primary role in the recommendation and prescription of any products for which we obtain marketing approval. Our future arrangements with third party payors and customers, if any, will subject us to broadly applicable fraud and abuse and other healthcare laws and regulations. The laws and regulations may constrain the business or financial arrangements and relationships through which we market, sell and distribute any products for which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations in the U.S. include the following:

- *Anti-Kickback Statute* . The federal healthcare 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;
- *False Claims Act* . 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;
- *HIPAA* . The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or 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, and, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms and technical safeguards, with respect to maintaining the privacy, security and transmission of individually identifiable health information;
- *Transparency Requirements* . Federal laws require applicable manufacturers of covered drugs to report payments and other transfers of value to physicians, other healthcare providers and teaching hospitals, as well as ownership and investment interests held by physicians and other healthcare providers and their immediate family members;
- *Controlled Substances Act* . The CSA regulates the handling of controlled substances such as JZP-386; and
- *Analogous State and Foreign Laws* . Analogous state and foreign fraud and abuse laws and regulations, such as state anti-kickback and false claims laws can apply to sales or marketing arrangements and claims involving healthcare items or services. In addition, some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures and govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Some state laws require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures. 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 pre-empted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. 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 government funded healthcare programs.

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 have a material adverse effect on 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. From time to time, our operations may involve the use of hazardous materials, including chemicals and biological materials, and may also produce hazardous waste products. Even if we contract with third parties for the disposal of these materials and waste products, we cannot completely eliminate the risk of contamination or injury resulting from these materials. In the event of contamination or injury resulting from the use or disposal of our hazardous materials, 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.

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, but 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 addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Current or future environmental laws and regulations may impair our research, development or production efforts, which could adversely affect our business, financial condition, results of operations or prospects. In addition, failure to comply with these laws and regulations may result in substantial fines, penalties or other sanctions.

Governments outside the United States tend to impose strict price controls, which may adversely affect our revenues, if any.

In some countries, such as the countries of the European Union, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. To obtain reimbursement or pricing approval in some countries, we, or our collaborators, may be required to conduct a clinical trial that compares the cost-effectiveness of our product to other available therapies. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business could be materially harmed.

RISKS RELATED TO EMPLOYEE MATTERS AND MANAGING GROWTH

Our future success depends on our ability to retain our Chief Executive Officer and other key executives and to attract, retain and motivate qualified personnel.

Our industry has experienced a high rate of turnover of management personnel in recent years. Our ability to compete in the highly competitive biotechnology and pharmaceuticals industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on the pharmaceutical research and development and business development expertise of Roger D. Tung, our President and Chief Executive Officer, as well as the other principal members of our management, scientific and development team. Although we have formal employment agreements with our executive officers, these agreements do not prevent them from terminating their employment with us at any time. In addition, although we maintain a key-man insurance policy with respect to Dr. Tung, we do not carry key-man insurance on any of our other executive officers or employees and may not carry any key-man insurance in the future.

If we lose one or more of our executive officers, our ability to implement our business strategy successfully could be seriously harmed. Furthermore, replacing executive officers 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 develop, gain marketing approval of and commercialize products successfully. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate these additional key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts 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 develop and commercialize product candidates will be limited.

We expect to grow our organization and, as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

As our pipeline grows and matures, we expect to experience significant growth in the number of our employees and the scope of our operations, including in the areas of drug manufacturing, regulatory affairs and sales, clinical development, marketing and distribution. Our management may need to divert a disproportionate amount of its attention away from our day-to-day activities to devote time to managing these growth activities. To manage these growth activities, 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 anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. Moreover, the expected expansion of our operations may lead to significant costs and may divert our business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

RISKS RELATED TO OUR COMMON STOCK

The price of our common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our common stock.

The trading price of our comment stock has been, and may continue to be, volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. 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. The market price for our common stock may be influenced by many factors, including:

- the success or failure to close our asset sale with Vertex;
- the success or failure of existing or new competitive products or technologies;
- the timing, advancement of and results of nonclinical studies and clinical trials of any of our product candidates;
- commencement or termination of collaborations for our development programs;
- failure, delays, changes to or discontinuation of any of our development programs;
- regulatory or legal developments in the United States and other countries;
- regulatory actions relating to our product candidates;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- disclosures by our collaborators relating to our product candidates or competitive programs;
- merger or acquisition activity of our collaborators;
- the level of expenses related to any of our product candidates or clinical development programs;
- the results of our efforts to develop additional product candidates or products;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- announcement or expectation of additional financing efforts;
- receipt or expectation of receipt of revenues such as milestones, royalties, grants and license fees;
- sales of our common stock by us, our insiders or other stockholders;
- programmed trading based on technical stock chart or other inputs;
- portfolio restructuring by large shareholders;
- addition or removal of our stock from stock indices;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in estimates or recommendations by securities analysts that cover our stock;
- actions by short-sellers or supporters of our stock, including social media postings or reports;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- legalization or the anticipation of possible legalization of drug reimportation from other countries;
- actual or anticipated changes in FDA practices;
- general economic, industry and market conditions; and
- the other factors described in this “Risk Factors” section.

An active trading market for our common stock may not be sustained.

Although we have listed our common stock on The NASDAQ Global Market, an active trading market for our common stock may not be sustained. In the absence of an active trading market for our common stock, investors may not be able to sell their common stock at or above the price at which they acquired their shares or at the times that they would like to sell. An inactive trading market may also impair our ability to raise capital to continue to fund operations by selling shares and may impair our ability to acquire other companies or technologies by using our shares as consideration.

We have broad discretion in the use of our cash reserves and may not use them effectively.

Our management has broad discretion to use our cash reserves and could use our cash reserves in ways that do not improve our results of operations or enhance the value of our common stock. The failure by our management to apply these funds effectively could result in financial losses that could have a material adverse effect on our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest our cash reserves in a manner that does not produce income or that loses value.

We are an "emerging growth company," and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act, and may remain an emerging growth company for up to five years from the date of our initial public offering. For so long as we remain an emerging growth company, we are permitted and plan to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or SOX Section 404, not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements, reduced disclosure obligations regarding executive compensation and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we are subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

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 new compliance initiatives and corporate governance practices.

As a public company, we are incurring and expect to incur additional significant legal, accounting and other expenses that we did not incur as a private company. We expect that these expenses will further increase after we are no longer an "emerging growth company." The Sarbanes-Oxley Act of 2002, or SOX, 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. We expect that we will need to hire additional personnel to comply with the requirements of being a public company, and our management and other personnel will need to devote a substantial amount of time towards maintaining compliance with these requirements. 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. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

Pursuant to SOX Section 404 we are required to evaluate the effectiveness of our internal control over financial reporting as of the end of each fiscal year and to report on this evaluation in our Annual Report on Form 10-K for the year. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. 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 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 that our internal control over financial reporting is effective as required by SOX Section 404. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

A significant portion of our total outstanding shares may be sold into the market in the near future, which could cause the market price of our common stock to decline significantly, even if our business is doing well.

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 of common stock intend to sell shares, could reduce the market price of our common stock.

In addition, as of February 15, 2017, there were 3,889,263 shares subject to outstanding options under our equity compensation plans, all of which shares we have registered under the Securities Act on a registration statement on Form S-8. These shares will be able to be freely sold in the public market upon exercise, as permitted by any applicable vesting requirements, except to the extent they are held by our affiliates, in which case such shares will become eligible for sale in the public market as permitted by Rule 144 under the Securities Act. Furthermore, as of February 15, 2017, there were 70,796 shares subject to an outstanding warrant to purchase common stock. These shares will become eligible for sale in the public market, to the extent such warrant is exercised, as permitted by Rule 144 under the Securities Act. Moreover, holders of a substantial portion of our outstanding common stock have rights, subject to conditions, to require us to file registration statements covering their shares or, along with the holder of our outstanding warrant to purchase common stock, to include their shares in registration statements that we may file for ourselves or other stockholders.

We do not anticipate paying any cash dividends on our capital stock in the foreseeable future, accordingly, stockholders must rely on capital appreciation, if any, for any return on their investment.

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

Our executive officers, directors and principal stockholders, if they choose to act together, have the ability to substantially influence all matters submitted to stockholders for approval.

As of December 31, 2016, our executive officers and directors, combined with our stockholders who owned more than 5% of our outstanding common stock, and all affiliates, in the aggregate, beneficially owned shares representing approximately 39.9% of our capital stock. As a result, if these stockholders were to choose to act together, they would be able to substantially influence all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they choose to act together, would substantially influence the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of ownership control may:

- delay, defer or prevent a change in control;
- entrench our management or the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other stockholders may desire.

Future sales of a substantial number of our common shares by our principal stockholders could depress the trading price of our common stock.

If our principal stockholders sell substantial amounts of shares of our common stock in the public market or if the market anticipates that these sales could occur, the market price of shares of our common stock could decline. These sales may make it more difficult for us to sell equity or equity-related securities in the future at a time and price that we deem appropriate, or to use equity as consideration for future acquisitions.

Provisions in our corporate charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our corporate charter and our bylaws may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which our stockholders might otherwise receive a premium for their shares. 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 the 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:

- establish a classified board of directors such that all members of the board are not elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;
- limit the manner in which stockholders can remove directors from the board;
- establish advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted on at stockholder meetings;
- require that stockholder actions must be effected at a duly called stockholder meeting and prohibit actions by our stockholders by written consent;
- limit who may call a special meeting of stockholders;
- authorize our board of directors to issue preferred stock without stockholder approval, which could be used to institute a “poison pill” that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our board of directors; and
- require the approval of the holders of at least 75% of the votes that all our stockholders would be entitled to cast to amend or repeal certain provisions of our charter or bylaws.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner. This could discourage, delay or prevent someone from acquiring us or merging with us, whether or not it is desired by, or beneficial to, our stockholders.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our share price and trading volume could decline.

The trading market for our common stock depends on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. There can be no assurance that analysts will cover us, or provide favorable coverage. If one or more analysts downgrade our stock or change their opinion of our stock, our share price may decline. In addition, if one or more analysts cease coverage of our Company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our share price or trading volume to decline.

RISKS RELATED TO ASSET SALE

If the sale of our cystic fibrosis assets, including CTP-656, to Vertex is not completed, we will have incurred substantial expenses without our stockholders realizing the expected benefits.

On March 3, 2017, we entered into an Asset Purchase Agreement with Vertex Pharmaceuticals (Europe) Limited, or “Vertex,” and Vertex Pharmaceuticals Incorporated (solely as a guarantor), pursuant to which, subject to the satisfaction or waiver of the conditions therein, we will sell and assign to Vertex the assets of the Company related to the synthesis, research and development of compounds as potential therapeutic products for treating cystic fibrosis. Completion of the asset sale is subject to closing conditions including, but not limited to, various regulatory approvals and the approval of our stockholders. We currently expect that the asset sale will be completed by October 31, 2017. It is possible, however, that factors outside of our control could require the parties to complete the asset sale at a later time, or not to complete the asset sale at all. In the event that the asset sale is not consummated for any reason, we will be subject to many risks, including the costs related to the asset sale, such as legal, accounting and advisory fees, which must be paid even if the asset sale is not completed, and, potentially, the payment of a termination fee under certain circumstances. If the asset sale is not consummated, the market price of our common stock could decline. We also could be subject to litigation related to any failure to complete the asset sale or related to any enforcement proceeding commenced against us to perform our obligations under the asset purchase agreement.

We will be subject to business uncertainties and contractual restrictions while the asset sale is pending.

The pursuit of the asset sale and the preparation for the integration of the related assets with Vertex may place a significant burden on management and internal resources. Any significant diversion of management and employee attention away from ongoing business and any difficulties encountered in the transition and integration process could affect our financial results. In addition, the asset purchase agreement generally requires that we operate in the usual, regular and ordinary course of business and restricts us from taking certain actions prior to the consummation of the asset sale or termination of the asset purchase agreement without Vertex's consent. These restrictions may prevent us from pursuing attractive business opportunities that may arise prior to the completion of the asset sale. The pendency of this agreement may also adversely affect the enrollment in our ongoing U.S. Phase 2 clinical trial.

Regulatory approvals, including antitrust approval, necessary for closing the agreement may not be received, may take longer than expected or impose conditions that are not presently anticipated.

Before the asset sale may be completed, certain approvals or consents must be obtained from the various regulatory authorities in the United States, including antitrust approvals. There can be no assurance as to whether regulatory approval will be received or the timing of the approvals. Vertex is only required to take commercially reasonable efforts to assist us in obtaining regulatory approvals of the asset sale and is not obligated to complete the asset sale if the regulatory approvals received in connection with the completion of the asset sale include any conditions or restrictions that would constitute a "Burdensome Term or Condition" as defined in the asset purchase agreement. There can be no assurance that regulatory approvals will not include such conditions or restrictions and such conditions or restrictions could have the effect of delaying completion of the asset purchase agreement, if it can be completed at all.

The purchase agreement includes a termination fee, restrictions on solicitation, and a right for Vertex to match a competing offer, which may discourage other companies from providing a superior offer.

Until the completion of the asset sale, with limited exceptions, we are prohibited from soliciting, initiating, encouraging or facilitating any inquiries or proposals that may lead to a proposal or offer for an acquisition, merger or other business combination transaction with any person other than Vertex. In addition, we have agreed to pay a termination fee of $6.4 million to Vertex in specified circumstances. These provisions could discourage other companies from trying to acquire CTP-656, or us, even though those other companies might be willing to offer greater value to our stockholders than Vertex has offered in the asset purchase agreement, including proposals that include the sale of our entire company. The payment of the termination fee also could have a material adverse effect on our results of operations.

The asset purchase agreement exposes us to contingent liabilities that could have a material adverse effect on our financial condition.

We have agreed to indemnify Vertex for damages resulting from or arising out of any inaccuracy or breach of our representations, warranties or covenants in the asset purchase agreement, any and all of our liabilities not assumed by Vertex in the asset sale and for certain other matters. Significant indemnification claims by Vertex could have a material adverse effect on our financial condition. In the event that claims for indemnification exceed certain thresholds set forth in the asset purchase agreement, we will be obligated to indemnify Vertex for any damages or loss resulting from such breach for up to $16 million, or in some cases, the entire purchase price paid to us by Vertex, including any milestone payments. Any event that results in a right for Vertex to seek indemnity from us could result in a substantial payment from us to Vertex and could adversely affect our results of operations.

ITEM 1B. Unresolved Staff Comments

None

ITEM 2. Properties

We lease our principal facilities, which consist of approximately 50,000 square feet of office, research and laboratory space located at 99 Hayden Avenue, Lexington, Massachusetts. The leases covering this space expire on September 30, 2018. We believe that our existing facilities are sufficient for our current needs for the foreseeable future.

ITEM 3. Legal Proceedings

We are not currently a party to any material legal proceedings.

ITEM 4. Mine Safety Disclosures

Not applicable.

Part II

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

MARKET INFORMATION

Our common stock has been publicly traded on the NASDAQ Global Market under the symbol "CNCE" since February 13, 2014. Prior to that time, there was no public market for our common stock. Set forth below is the quarterly information with respect to the high and low prices for our common stock for the most recent fiscal year.

	High	Low
Year Ended December 31, 2016		
First Quarter	$ 19.69	$ 12.16
Second Quarter	15.53	9.80
Third Quarter	12.28	9.47
Fourth Quarter	10.53	7.11
Year Ended December 31, 2015		
First Quarter	$ 18.29	$ 11.85
Second Quarter	17.84	13.11
Third Quarter	22.80	14.01
Fourth Quarter	25.04	18.47

HOLDERS

As of January 31, 2017, there were 22 holders of record of our common stock. This number does not include beneficial owners whose shares are held by nominees in street name.

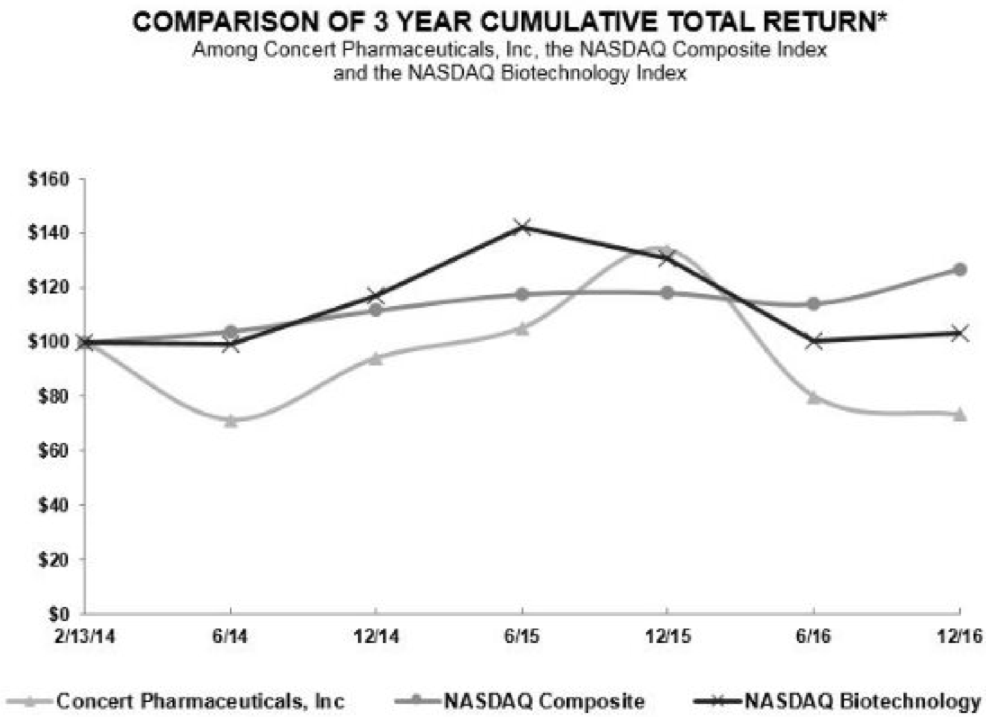
DIVIDENDS

We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. We do not intend to pay any cash dividends to the holders of our common stock in the foreseeable future.

PERFORMANCE GRAPH

The following performance graph and related information shall not be deemed to be "soliciting material" or to be "filed" with the SEC for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or otherwise subject to the liabilities under that Section, nor shall such information be incorporated by reference into any future filing under the Exchange Act or the Securities Act of 1933, as amended, or the Securities Act, except to the extent that we specifically incorporate it by reference into such filing.

The following graph compares the performance of our common stock to The NASDAQ Composite Index and to The NASDAQ Biotechnology Index from February 13, 2014 (the first date that shares of our common stock were publicly traded) through December 31, 2016. The comparison assumes $100 was invested after the market closed on February 13, 2014 in our common stock and in each of the foregoing indices, and it assumes reinvestment of dividends, if any. The stock price performance included in this graph is not necessarily indicative of future stock price performance.



*$100 invested on 2/13/14 in each of our common stock, the NASDAQ Composite Index and the NASDAQ Biotechnology Index, including reinvestment of dividends.

PURCHASE OF EQUITY SECURITIES

We did not purchase any of our registered equity securities during the period covered by this Annual Report on Form 10-K.

ITEM 6. Selected Financial Data

The following tables set forth our selected consolidated financial data and has been derived from our audited consolidated financial statements. You should read the following selected consolidated financial data together with our consolidated financial statements and accompanying notes appearing elsewhere in this Annual Report on Form 10-K and the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report on Form 10-K. Our historical results for any prior period are not necessarily indicative of the results that may be expected in any future period.

	Years ended December 31,				
(in thousands, except per share data)	2016	2015	2014	2013	2012
Results of Operations					
Total revenue	$ 174	$ 66,729	$ 8,576	$ 25,408	$ 12,849
Operating expenses:					
Research and development	$ 36,983	$ 28,885	$ 27,474	$ 21,790	$ 24,193
General and administrative	14,358	13,056	11,700	8,028	7,266
Total operating expenses	51,341	41,941	39,174	29,818	31,459
(Loss) Income from operations	(51,167)	24,788	(30,598)	(4,410)	(18,610)
Interest and other income (expense), net	447	(185)	(1,101)	(1,646)	(1,834)
Provision for income taxes	—	429	—	—	—
Net (loss) income	$ (50,720)	$ 24,174	$ (31,699)	$ (6,056)	$ (20,444)
Accretion on redeemable convertible preferred stock	—	—	(55)	(396)	(388)
Net (loss) income applicable to common stockholders - basic and diluted	$ (50,720)	$ 24,174	$ (31,754)	$ (6,452)	$ (20,832)
Earnings Per Share					
Net (loss) income per share applicable to common stockholders - basic	$ (2.28)	$ 1.14	$ (2.00)	$ (4.99)	$ (16.15)
Net (loss) income per share applicable to common stockholders - diluted	$ (2.28)	$ 1.09	$ (2.00)	$ (4.99)	$ (16.15)
Weighted-average number of common shares used in net (loss) income per share applicable to common stockholders - basic	22,233	21,152	15,842	1,292	1,290
Weighted-average number of common shares used in net (loss) income per share applicable to common stockholders - diluted	22,233	22,267	15,842	1,292	1,290
Financial Condition					
Cash and cash equivalents	$ 40,555	$ 92,510	$ 13,396	$ 9,638	$ 7,490
Investments, available for sale	55,630	49,680	65,836	23,039	20,067
Working capital	92,159	137,481	63,102	18,128	20,940
Total assets	100,395	146,932	84,454	39,773	33,129
Deferred revenue	10,050	10,170	15,821	19,631	2,750
Loan payable, net of discount	—	—	7,101	14,919	19,731
Redeemable convertible preferred stock	—	—	—	112,244	111,848
Total stockholders' equity (deficit)	85,594	130,635	54,825	(112,104)	(106,687)

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 the related notes appearing elsewhere in this Annual Report on Form 10-K. Some of the information contained in this discussion and analysis or set forth elsewhere in this report, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. You should read the "Risk Factors" section in Part 1—Item 1A. of this report for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

OVERVIEW

We are a clinical stage biopharmaceutical company applying our extensive knowledge of deuterium chemistry to discover and develop novel small molecule drugs. Selective incorporation of deuterium into known molecules has the potential, on a case-by-case basis, to provide better pharmacokinetic or metabolic properties, thereby enhancing their clinical safety, tolerability or efficacy. Our approach typically starts with approved drugs that we believe may be improved with deuterium substitution. Our technology provides the opportunity to develop products that may compete with the non-deuterated drug in existing markets or to leverage the known activity of approved drugs to expand into new indications. Our deuterated chemical entity platform, or DCE Platform®, has broad potential across numerous therapeutic areas. As discussed in detail in Item 1 above, we have a robust pipeline of wholly owned and collaboration programs.

Since our inception in 2006, we have devoted substantially all of our resources to our research and development efforts, including activities to develop our deuterated chemical entity platform, or DCE Platform, and our core capabilities in deuterium chemistry, identify potential product candidates, undertake nonclinical studies and clinical trials, manufacture clinical trial material in compliance with current good manufacturing practices, provide general and administrative support for these operations and establish our intellectual property. We have generated an accumulated deficit of $171.9 million since inception through December 31, 2016 and will require substantial additional capital to fund our research and development. We do not have any products approved for sale and have not generated any revenue from product sales. We have funded our operations primarily through the public offering and private placement of our equity, debt financing and funding from collaborations and patent assignments. In March 2015, we sold 3,300,000 shares of common stock at a price to the public of $15.15 per share, resulting in net proceeds to us of $46.7 million, after deducting the underwriting discounts, commissions and offering-related transaction costs.

On March 3, 2017, we entered into an Asset Purchase Agreement with Vertex, through Vertex Pharmaceuticals (Europe) Limited, pursuant to which we agreed to sell and assign, subject to the satisfaction or waiver of certain conditions, the cystic fibrosis assets of the Company, including CTP-656, for up to $250 million. Additional information concerning the sale of CTP-656 is discussed further in Note 18 in the consolidated financial statements, Item 1A. and Item 9B., each appearing elsewhere in this Annual Report on Form 10-K.

We have incurred net losses in each year from our inception in 2006, except for fiscal year 2015. We generated a net loss of $50.7 million during the year ended December 31, 2016 and generated net income of $24.2 million for the year ended December 31, 2015. The net income generated during the year ended December 31, 2015 was primarily the result of a $50.2 million one-time payment from Auspex Pharmaceuticals, Inc., or Auspex, as discussed further in Note 14 in the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. Our operating results may fluctuate significantly from year to year, depending on the timing and magnitude of clinical trial and other development activities under our current development programs. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations.

We expect to continue to incur significant expenses and increasing operating losses for at least the next several years. We expect our expenses will increase substantially in connection with our ongoing activities as we continue research and development efforts and develop and conduct additional nonclinical studies and clinical trials with respect to our product candidates.

We do not expect to generate revenue from product sales unless and until we, or our collaborators, obtain marketing approval for one or more of our product candidates, which we expect will take a number of years and is subject to significant uncertainty. If we obtain, or believe that we are likely to obtain, marketing approval for any product candidates for which we retain commercialization rights, and intend to commercialize a product, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. We expect to seek to fund our operations through a combination of equity offerings, debt financings, additional collaborations and licensing arrangements, and other sources for at least the next several years. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. Our failure to raise capital or enter into such other arrangements as and when needed would force us to delay, limit, reduce or terminate our research and development programs and could have a material adverse effect on our financial condition and our ability to develop our products. We will need to generate significant revenues to achieve sustained profitability and we may never do so.

COLLABORATIONS

We have entered into a number of collaborations for the research, development and commercialization of deuterated compounds. To date, our collaborations have provided us with significant funding for both our specific development programs and our DCE Platform. Our collaborators also have applied their considerable scientific, development, regulatory and commercial capabilities to the development of our compounds. In addition, in some instances, where we develop and seek to collaborate with respect to deuterated analogs of marketed drugs or of drug candidates that are more advanced in clinical trials, our collaborators may be eligible for an expedited development or regulatory pathway by relying on previous clinical data regarding their corresponding non-deuterated compound. We believe that our collaborations have contributed to our ability to progress our product candidates and build our DCE Platform. We have established the following key collaborations, which are discussed further in Note 13 in the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Avanir

In February 2012, we entered into a development and license agreement with Avanir under which we granted Avanir an exclusive worldwide license to develop, manufacture and commercialize deuterated dextromethorphan analogs, including d_6-dextromethorphan, or deudextromethorphan. Avanir is currently focused on developing AVP-786, which is a combination of deudextromethorphan and an ultra- low dose of quinidine, for the treatment of neurologic and psychiatric disorders. In January 2015, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. and it is now a wholly owned subsidiary of Otsuka America, Inc.

Under the agreement, we received a non-refundable upfront payment of $2.0 million and have received milestone payments of $6.0 million. We have the potential to earn up to $162.0 million in additional development, regulatory and sales-based milestone payments, of which $21.5 million in development and regulatory milestone payments are associated with the first indication. The next anticipated milestone payments that we may be entitled to receive are $5.0 million upon acceptance for filing of a NDA, $3.0 million upon acceptance for filing of a MAA, and $1.5 million upon acceptance for filing of a NDA by the Ministry of Health, Labour, and Welfare, or MHLW, related to AVP-786. Avanir also is required to pay us royalties at defined percentages ranging from the mid-single digits to low double digits below 20% on net sales of licensed products on a country-by-country basis.

Celgene

In April 2013, we entered into a master development and license agreement with Celgene, which is primarily focused on the research, development and commercialization of specified deuterated compounds targeting inflammation or cancer. While the collaboration has the potential to encompass multiple programs, it is initially focused on one program, CTP-730, which is deuterated apremilast.

We were responsible for conducting and funding research and early development activities for the CTP-730 program pursuant to mutually agreed upon development plans. This included the completion of single and multiple ascending dose Phase 1 clinical trials. Celgene is responsible for any development of CTP-730 beyond the completed Phase 1 clinical trials. If Celgene exercises its rights with respect to any additional program and pays us the applicable exercise fee, we are responsible for conducting research and development activities at our own expense pursuant to mutually agreed upon development plans until the completion of the first Phase 1 clinical trial, which will be defined in each development plan on a program-by-program basis, discussed further in Note 13 in the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. In addition, if Celgene exercises its rights with respect to the option program and pays us the applicable exercise fee, we are responsible for seeking to generate a deuterated compound for clinical development in the selected option program at our own expense.

Under the agreement, we received a non-refundable upfront payment of $35.0 million and received an $8.0 million development milestone in October 2015 upon completion of clinical evaluation for CTP-730. In addition, we have the potential to earn up to $312.5 million in additional development, regulatory and sales-based milestone payments with respect to CTP-730. The next milestone that we may be entitled to receive is $15.0 million upon the first dosing in a Phase 3 clinical trial or, if earlier, acceptance for filing a new drug application, or NDA, related to CTP-730. If Celgene exercises its rights under any additional program, we may be eligible for milestone payments for each additional program. In addition, with respect to each program, Celgene is required to pay us royalties on worldwide net sales of each licensed product at defined percentages ranging from the mid-single digits to low double digits below 20%.

Jazz Pharmaceuticals

In February 2013, we entered into a development and license agreement with Jazz Pharmaceuticals to research, develop and commercialize products containing a deuterated sodium oxybate analog, or D-SXB. Jazz Pharmaceuticals is initially focused on developing one analog, designated as JZP-386 for the treatment of narcolepsy. Under the terms of the agreement, we granted Jazz Pharmaceuticals an exclusive, worldwide, royalty-bearing license under intellectual property controlled by us to develop, manufacture and commercialize D-SXB products including, but not limited to, JZP-386.

We, together with Jazz Pharmaceuticals, have conducted certain development activities for Phase 1 clinical trials with respect to JZP-386 pursuant to an agreed upon development plan. We were responsible under the development plan for conducting the Phase 1 clinical trials with respect to JZP-386. Thereafter, our obligations to conduct further development activities are subject to mutual agreement. Jazz Pharmaceuticals has assumed all manufacturing and development responsibilities relating to JZP-386.

Under the agreement, we received a non-refundable upfront payment of $4.0 million and are eligible to earn an aggregate of up to $113.0 million in development, regulatory and sales-based milestone payments. The next milestone payment that we may be entitled to receive is $4.0 million related to initiation of the first Phase 2 clinical trial of JZP-386. In addition, Jazz Pharmaceuticals is required to pay us royalties at defined percentages ranging from the mid-single digits to low double digits below 20% on worldwide net sales of licensed products.

For further discussion regarding our collaboration agreements, refer to Note 13 in the consolidated financial statements.

PATENT ASSIGNMENT AGREEMENT

In September 2011, we entered into a patent assignment agreement with Auspex Pharmaceuticals, Inc., or Auspex, pursuant to which we assigned to Auspex a U.S. patent application relating to deuterated pirfenidone analogs as described in Note 14 in the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. Among other things, the patent assignment agreement provides that if Auspex is acquired in a change in control transaction at any time while it, or any of its affiliates, own certain patents or patent applications related to deuterated pirfenidone, we will receive within a specified period following the closing of the transaction 1.44% of any proceeds payable as consideration for the change in control transaction, including any amounts paid to stockholders and certain equity holders of Auspex. Any such change in control payment to us is credited to Auspex as a deduction against certain future payments that may become due under the agreement, such that Auspex will not be required to make further payments to us until the aggregate amount of such payments otherwise due exceeds the amount of the change in control payment.

Pursuant to the agreement, we became eligible to receive a one-time payment of $50.2 million, which was received in June 2015, due to Teva Pharmaceutical Industries Ltd.’s acquisition of Auspex in May 2015.

FINANCIAL OPERATIONS OVERVIEW

Revenue

We have not generated any revenue from the sales of products. All of our revenue to date has been generated through collaboration, license and research arrangements with collaborators and nonprofit organizations for the development and commercialization of product candidates and a patent assignment agreement.

The terms of these agreements include one or more of the following types of payments: non-refundable license fees, payments for research and development activities, payments based upon the achievement of specified milestones, payment of license exercise or option fees relating to product candidates and royalties on any net product sales. To date, we have received non-refundable upfront payments, several milestone payments, payments for research and development services provided to our collaborators and a change in control payment pursuant to a patent assignment agreement. However, we have not yet earned any license exercise or option fees, sales-based milestone payments or royalty revenue as a result of product sales.

In the future, we will seek to generate revenue from a combination of product sales and milestone payments and royalties on product sales in connection with our current collaborations with Avanir, Celgene, and Jazz Pharmaceuticals, or other collaborations we may enter into.

Research and development expenses

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

- employee-related expenses, including salary, benefits, travel and stock-based compensation expense;
- expenses incurred under agreements with contract research organizations and investigative sites that conduct our clinical trials;
- the cost of acquiring, developing and manufacturing clinical trial materials;
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance and other supplies;
- platform-related lab expenses, which includes costs related to synthesis, analysis and *in vitro* and *in vivo* characterization of deuterated compounds to support the selection and progression of potential product candidates;
- expenses related to consultants and advisors; and
- costs associated with nonclinical activities and regulatory operations.

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.

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.

The successful development of any of our product candidates is highly uncertain. As such, at this time, we cannot reasonably predict with certainty the duration and completion costs of the current or future clinical trials of any of our product candidates or if, when, or to what extent we will generate revenues from the commercialization and sale of any of our product candidates that obtain marketing approval. We may never succeed in achieving regulatory approval for any of our product candidates. The duration, costs, and timing of clinical trials and development of our product candidates will depend on a variety of factors, including:

- the scope and rate of progress of our ongoing as well as any additional clinical trials and other research and development activities;
- conduct of and results from ongoing as well as any additional clinical trials and research and development activities;
- significant and changing government regulation;
- the terms and timing and receipt of any regulatory approvals;
- the performance of our collaborators;
- our ability to manufacture any of our product candidates that we are developing or may develop in the future; and
- the expense and success of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights, including potential claims that we infringe other parties' intellectual property.

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 or another regulatory authority were to require us to conduct clinical trials or other research and development activities beyond those that we currently anticipate will be required for the completion of clinical development of a product candidate, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, due to the increased size and duration of later-stage clinical trials and the manufacturing that is typically required for those later-stage clinical trials. We expect research and development costs to increase significantly for the foreseeable future as our product candidate development programs progress but we do not believe that it is possible at this time to accurately project total program-specific expenses through commercialization. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

General and administrative expenses

General and administrative expenses consist primarily of salaries and related costs for personnel, including stock-based compensation and travel expenses for our employees in executive, operational, finance, legal, business development and human resource functions. Other general and administrative expenses include facility-related costs, depreciation and other expenses not allocated to research and development expense and professional fees for directors, accounting and legal services and expenses associated with obtaining and maintaining patents.

We anticipate that our general and administrative expenses will increase in the future as our pipeline grows and matures. Additionally, if and when we believe a regulatory approval of the first product candidate that we intend to commercialize on our own appears likely, we anticipate an increase in payroll and related expenses as a result of our preparation for commercial operations, especially as it relates to the sales, marketing and distribution of our product candidates.

Investment income

Investment income consists of interest income earned on cash equivalents and investments. The amount of investment income earned in any particular period may vary primarily as a result of the amount of cash equivalents and investments held during the period and the types of securities included in our portfolio during the period. Our current investment policy is to maintain a diversified investment portfolio of U.S. government-backed securities and money market mutual funds consisting of U.S. government-backed securities.

Interest and other expense

Interest and other expense consists primarily of interest expense on amounts outstanding under our prior debt facility with Hercules Technology Growth Capital, Inc., or Hercules, amortization of debt discount and the re-measurement gain or loss associated with the change in the fair value of a preferred stock warrant liability. On October 1, 2015, we made a final payment to Hercules, thereby fulfilling all obligations under our debt facility. Upon completion of our IPO in February 2014, the warrant became exercisable for an aggregate of 70,796 shares of our common stock at an exercise price of $14.13 per share and the related warrant liability was reclassified to additional paid-in capital and will not be subject to re-measurement in future periods.

Income Taxes

We record a provision or benefit for income taxes on pre-tax income or loss based on our estimated effective tax rate for the year. No tax provision was recorded during the year ended December 31, 2016 due to the net loss generated. We recorded $0.4 million in income tax expense during the year ended December 31, 2015. The tax expense is the result of alternative minimum tax ("AMT") which, in accordance with the U.S. federal tax code, limits the use of net operating loss carryforwards to ninety percent of AMT income resulting in an effective tax rate of approximately two percent. No provision was recorded during the year ended December 31, 2014 due to the net loss generated.

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 financial statements requires us to make judgments and estimates that affect the reported amounts of assets, liabilities, revenues, and expenses and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events, and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates. On an ongoing basis, we evaluate our judgments and estimates in light of changes in circumstances, facts and experience. The effects of material revisions in estimates, if any, will be reflected in the consolidated financial statements prospectively from the date of change in estimates.

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 used in the preparation of our financial statements require the most significant judgments and estimates:

- revenue recognition;
- accrued research and development expense; and
- stock-based compensation.

Revenue recognition

We have primarily generated revenue through arrangements with collaborators for the development and commercialization of product candidates.

Collaboration revenue

The terms of our collaboration and license agreements have typically contained multiple elements, or deliverables, which have included licenses, or options to obtain licenses, to product candidates, referred to as exclusive licenses, as well as research and development activities to be performed by us on behalf of the collaborator related to the licensed product candidates. Payments that we may receive under these agreements include non-refundable upfront license fees, payment for research and development activities, payments based upon achievement of specified milestones, payment upon exercise of license rights or options to license product candidates and royalties on any resulting product sales.

Multiple-Element Arrangements . Our collaborations primarily represent multiple-element arrangements. We analyze multiple-element arrangements based on the guidance in Financial Accounting Standards Board, or FASB, Accounting Standards Codification, or ASC, Topic 605-25, *Revenue Recognition-Multiple-Element Arrangements* , or ASC 605-25. Pursuant to the guidance in ASC 605-25, we evaluate multiple-element arrangements to determine the deliverables included in the arrangement and whether the individual deliverables represent separate units of accounting or whether they must be accounted for as a combined unit of accounting. This evaluation involves subjective determinations and requires us to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that: (1) the delivered item(s) has value to the customer on a standalone basis and (2) if the arrangement includes a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially in our control. In assessing whether a delivered item(s) has standalone value, we consider whether the collaboration partner can use the delivered item(s) for its intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s) and whether there are other vendors that can provide the undelivered element(s). In making these assessments, we consider factors such as the research, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. The terms of our collaboration and licensing arrangements do not contain general rights of return that would preclude recognition of revenue.

Arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method. We determine the selling price of a unit of accounting following the hierarchy of evidence prescribed by ASC 605-25. Accordingly, we determine the estimated selling price for units of accounting within each arrangement using vendor-specific objective evidence of selling price, if available, third-party evidence of selling price if vendor-specific objective evidence is not available, or best estimate of selling price if neither vendor-specific objective evidence nor third-party evidence is available. We typically use best estimate of selling price to estimate the selling price for exclusive licenses and research and development services, since we generally do not have vendor-specific objective evidence or third-party evidence of selling price for these items. Determining the best estimate of selling price for a unit of accounting requires significant judgment. In developing the best estimate of selling price for a unit of accounting, we consider applicable market conditions and relevant entity-specific factors, including factors that were contemplated in negotiating the agreement with the customer and estimated costs. We validate the best estimate of selling price for units of accounting by evaluating whether changes in the key assumptions used to determine the best estimate of selling price will have a significant effect on the allocation of arrangement consideration between multiple units of accounting.

Our multiple-element revenue arrangements may include the following:

- *Option Arrangements* . An option to obtain an exclusive license is considered substantive if, at the inception of the arrangement, we are at risk as to whether the collaboration partner will choose to exercise the option. Factors that we consider in evaluating whether an option is substantive include the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising the option, the cost to exercise the option and the likelihood that the option will be exercised. For arrangements under which an option is considered substantive, we do not consider the item underlying the option to be a deliverable at the inception of the arrangement and the associated option fees are not included in allocable arrangement consideration, assuming the option is not priced at a significant and incremental discount. Conversely, for arrangements under which an option is not considered substantive, we would consider the item underlying the option to be a deliverable at the inception of the arrangement and a corresponding amount would be included in the allocable arrangement consideration. A significant and incremental discount included in an otherwise substantive option is considered to be a separate deliverable at the inception of the arrangement.

- *Exclusive Licenses* . We recognize arrangement consideration allocated to each unit of accounting when all of the revenue recognition criteria included in ASC Topic 605 *Revenue Recognition* are satisfied for that particular unit of accounting. We will recognize as revenue arrangement consideration attributed to exclusive licenses that have standalone value from the other deliverables to be provided in an arrangement upon delivery. We will recognize as revenue arrangement consideration attributed to exclusive licenses that do not have standalone value from the other deliverables to be provided in an arrangement over our estimated performance period as the arrangement would be accounted for as a single, combined unit of accounting.
- *Research and Development Services* . We recognize revenue associated with research and development services over the associated period of performance. If there is no discernible pattern of performance and/or objectively measurable performance measures do not exist, then we recognize revenue on a straight-line basis over the period we are expected to complete our performance obligations. Conversely, if the pattern of performance in which the service is provided to the customer can be determined and objectively measurable performance measures exist, then we recognize revenue under the arrangement using the proportional performance method, which requires us to make certain estimates when determining the proportion of services rendered in relation to the total services expected to be rendered.

Milestone Revenue . At the inception of an arrangement that includes milestone payments, we evaluate whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether:

- the consideration is commensurate with either our performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from our performance to achieve the milestone;
- the consideration relates solely to past performance; and
- the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement.

We evaluate factors such as the scientific, clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone and the level of effort and investment required to achieve the respective milestone in making this assessment. There is considerable judgment involved in determining whether a milestone satisfies all of the criteria required to conclude that a milestone is substantive. We have concluded that all of the development and regulatory milestones included in our current collaboration arrangements are substantive. Accordingly, in accordance with FASB ASC Topic 605-28, *Revenue Recognition-Milestone Method* , revenue from development and regulatory milestone payments will be recognized in their entirety upon successful accomplishment of the milestone, assuming all other revenue recognition criteria are met. Milestones that are not considered substantive would be recognized as revenue over the remaining period of performance, assuming all other revenue recognition criteria are met. Revenue from sales-based milestone payments will be accounted for as royalties and recognized as revenue upon achievement of the milestone, assuming all other revenue recognition criteria are met.

Royalty Revenue . We will recognize royalty revenue in the period of sale of the related product(s), based on the underlying contract terms, provided that the reported sales are reliably measurable and we have no remaining performance obligations, assuming all other revenue recognition criteria are met.

Accrued research and development expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. We make estimates of our accrued expenses as of each balance sheet date in our financial statements based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include fees paid to:

- contract research organizations in connection with clinical trials;
- investigative sites in connection with clinical trials;
- vendors in connection with nonclinical development activities; and
- vendors related to product manufacturing, development and distribution of clinical supplies.

We generally accrue expenses related to research and development activities based on the services received and efforts expended pursuant to contracts with multiple contract research organizations that conduct and manage clinical trials on our behalf as well as other vendors that provide research and development services. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the clinical expense. Payments under some of these contracts depend on factors such as the successful enrollment of subjects and the completion of clinical trial milestones. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid accordingly. Non-refundable 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.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed we may report amounts that are too high or too low in any particular period. To date, there has been no material differences from our estimates to the amount actually incurred.

Stock-Based Compensation

Since our inception in May 2006, we have applied the fair value recognition provisions of Financial Accounting Standards Board Accounting Standards Codification Topic 718, *Compensation-Stock Compensation* , which we refer to as ASC 718, to account for stock-based compensation arrangements with our employees. Stock-based compensation arrangements with non-employees has not been significant. We use the Black-Scholes-Merton option pricing model for determining the estimated fair value for stock-based awards on the date of grant, which requires the use of subjective and complex assumptions to determine the fair value of stock-based awards, including the fair value of the common stock underlying stock-based compensation awards (for periods prior to our IPO), the award's expected term and the price volatility of the underlying stock. We recognize the value of the portion of the awards that is ultimately expected to vest as expense over the requisite vesting periods on a ratable basis for the entire award. Our awards granted to employees generally have a ten year term and typically vest over a four year period.

Prior to our IPO, the estimated fair value of our common stock was determined by our board of directors based on contemporaneous and retrospective valuation estimates provided by management and prepared in accordance with the framework of the American Institute of Certified Public Accountants' Technical Practice Aid, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation* as well as independent third-party valuations. Our valuations of our common stock were based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry sector and the prices at which we sold shares of preferred stock, the superior rights and preferences of securities senior to our common stock at the time of each grant and the likelihood of achieving a liquidity event such as an IPO. Since our IPO, the exercise price per share of all option grants has been set at the closing price of our common stock on The NASDAQ Global Market on the applicable date of grant.

Because there had been no public market for our common stock prior to our IPO, we believe that we have insufficient data from our limited public trading history to appropriately utilize company-specific historical and implied volatility information. Accordingly, we utilize data from a representative group of publicly traded companies to estimate expected stock price volatility. We selected representative companies from the biopharmaceutical industry with similar characteristics as us, including stage of product development and therapeutic focus.

The expected term of awards represents the period of time that the awards are expected to be outstanding. We use the simplified method as prescribed by the Securities and Exchange Commission Staff Accounting Bulletin No. 107, *Share-Based Payment* as we do not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term of stock options granted to employees.

We utilize a dividend yield of zero based on the fact that we have never paid cash dividends and have no current intention of paying cash dividends. The risk-free interest rate was estimated using an average of treasury bill interest rates over a period commensurate with the expected term of the option at the time of grant. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

We have computed the fair value of employee stock options at the date of grant using the following weighted-average assumptions:

	Year ended December 31,		
	2016	2015	2014
Expected volatility	78.29%	73.38%	80.94%
Expected term	6.0 years	6.0 years	6.0 years
Risk-free interest rate	1.36%	1.69%	1.90%
Expected dividend yield	—%	—%	—%

PENDING AND RECENTLY ADOPTED ACCOUNTING PRONOUNCEMENTS

In May 2014, the FASB issued Accounting Standards Update, or ASU, No. 2014-09, *Revenue from Contracts with Customers (Topic 606)* , or ASU 2014-09, which stipulates that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve this core principle, ASU 2014-09 provides that an entity should apply the following steps: (1) identify the contract(s) with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract and (5) recognize revenue when (or as) the entity satisfies a performance obligation. This update will be effective for us beginning in the first quarter of fiscal 2018 as a result of the FASB's one year deferral of the effective date for this standard. The amendments may be applied retrospectively to each prior period (full retrospective) or retrospectively with the cumulative effect recognized as of the date of initial application (modified retrospective). We will adopt ASU 2014-09 in the first quarter of 2018 and will apply the full retrospective approach. We are currently evaluating the effect of adopting the requirements of ASU 2014-09 as it relates to the accounting for our collaboration arrangements with Celgene, Jazz and Avanir, and our patent assignment agreement with Auspex.

In August 2014, the FASB issued ASU No. 2014-15, *Disclosure of Uncertainties About an Entity's Ability to Continue as a Going Concern* , or ASU 2014-15. ASU 2014-15 amends FASB Accounting Standards Codification 205-40 *Presentation of Financial Statements – Going Concern* , by providing guidance on determining when and how reporting entities must disclose going-concern uncertainties in their financial statements, including requiring management to perform interim and annual assessments of an entity's ability to continue as a going concern within one year of the date of issuance of the entity's financial statements and providing certain disclosures if there is substantial doubt about the entity's ability to continue as a going concern. We are required to apply the requirements of ASU 2014-15 in our annual financial statements for the period ended December 31, 2016 and for interim financial statements beginning in the first quarter of fiscal 2017. With respect to the 2016 annual financial statements, we did not identify any conditions or events that raise substantial doubt about our ability to continue as a going concern within one year after the date the financial statements are issued.

In February 2016, the FASB issued ASU No. 2016-02, *Leases* (Topic 842), or ASU 2016-02. ASU 2016-02 requires lessees to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with terms of more than 12 months. ASU 2016-02 also will require certain qualitative and quantitative disclosures designed to give financial statement users information on the amount, timing, and uncertainty of cash flows arising from leases. ASU 2016-02 will be effective for us on January 1, 2019, with early adoption permitted. We are currently evaluating the impact ASU 2016-02 will have on our financial statements.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation-Stock Compensation-Improvements to Employee Share-Based Payment Accounting* , or ASU 2016-09. This update simplifies several aspects of the accounting for share-based compensation arrangements, including accounting for income taxes, forfeitures and statutory tax withholding requirements as well as classification of related amounts on the statement of cash flows. The ASU is effective for fiscal years beginning after December 15, 2016, with early adoption permitted. The Company has evaluated this ASU and does not expect it to have a material effect on our financial statements and related disclosures.

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments-Credit Losses (Topic 326)-Measurement of Credit Losses on Financial Instruments* , or ASU 2016-13. The new standard requires entities to measure all expected credit losses for financial assets held at the reporting date based on historical experience, current conditions and reasonable and supportable forecasts. ASU 2016-13 will become effective for fiscal years beginning after December 15, 2019, with early adoption permitted. We are currently evaluating the impact ASU 2016-13 will have on our financial statements and related disclosures.

RESULTS OF OPERATIONS

Comparison of the years ended December 31, 2016 and 2015

The following table summarizes our results of operations for the years ended December 31, 2016 and 2015, together with the changes in those items in dollars.

	Year ended December 31,		
(in thousands)	**2016**	**2015**	**Change**
Revenue:			
License and research and development revenue	$ 174	$ 6,574	$ (6,400)
Other revenue	—	50,155	(50,155)
Milestone revenue	—	10,000	(10,000)
Total revenue	174	66,729	(66,555)
Operating expenses:			
Research and development	36,983	28,885	8,098
General and administrative	14,358	13,056	1,302
Total operating expenses	51,341	41,941	9,400
(Loss) Income from operations	(51,167)	24,788	(75,955)
Investment income	447	124	323
Interest and other expense	—	(309)	309
(Loss) Income before income taxes	(50,720)	24,603	(75,323)
Provision for income taxes	—	429	(429)
Net (loss) income	$ (50,720)	$ 24,174	$ (74,894)

License and Research and Development Revenue

License and research and development revenue was $0.2 million for the year ended December 31, 2016 as compared to $6.6 million for the prior year period, a decrease of $6.4 million. The decrease in revenue in the 2016 period was primarily due to a decrease in revenue recognized for services performed under our Celgene and Jazz Pharmaceuticals collaboration agreements of $5.5 million and $0.8 million, respectively. These changes were attributable to the completion of clinical conduct under these programs in 2015.

Other Revenue

Other revenue recognized during the year ended December 31, 2015 was attributable to our patent assignment agreement with Auspex, whereby we received a one-time change in control payment of $50.2 million from Auspex, which was acquired by Teva Pharmaceutical Industries Ltd. in May 2015.

Milestone Revenue

Milestone revenue recognized during the year ended December 31, 2015 was attributable to an $8.0 million milestone payment earned upon completion of Phase 1 clinical evaluation for CTP-730 as well as a $2.0 million milestone payment earned as a result of the initial dosing in a Phase 3 clinical trial of AVP-786.

As of December 31, 2016, we had deferred revenue of:

- $7.2 million related to our collaboration with Celgene, $1.1 million of which is attributable to the CTP-730 program and is currently expected to be recognized as revenue in the next twelve months as we satisfy our remaining research and development activities pursuant to mutually agreed upon development plans, and $6.1 million of which is attributable to two additional license programs that we will not recognize as revenue until Celgene exercises its rights with respect to those programs, or at such time that Celgene's rights lapse, as discussed further in Note 13 to the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K;

- $0.1 million related to our collaboration with Jazz Pharmaceuticals and associated with research and development services to be performed and recognized as revenue over the estimated remaining performance period of 24 months; and
- $2.8 million related to a payment received from GSK that we will not recognize as revenue until all repayment obligations lapse in 2018.

Research and development expenses

The following table summarizes our external research and development expenses, by program, for the years ended December 31, 2016 and 2015, with our internal research expenses separately classified by category. Because Avanir is conducting the clinical development of AVP-786 at its expense, we made minimal investment in the program during these periods.

	Year ended December 31,	
(in thousands)	**2016**	**2015**
CTP-656 external costs	9,592	3,759
CTP-543 external costs	7,603	2,064
CTP-730 external costs	31	2,711
JZP-386 external costs	19	1,084
External costs for other programs	1,732	2,622
Employee and contractor-related expenses	14,523	13,507
Facility and other expenses	3,483	3,138
Total research and development expenses	$ 36,983	$ 28,885

Research and development expenses were $37.0 million for the year ended December 31, 2016, compared to $28.9 million for the prior year period, an increase of $8.1 million. This increase was primarily due to an increase of $5.8 million and $5.5 million in direct external expenses associated with CTP-656 and CTP-543, respectively, which were partially attributable to the conduct of Phase 1 clinical testing during the year ended December 30, 2016, as well as costs incurred to support the advancement of CTP-656 and CTP-543 into Phase 2 clinical testing. The increase in employee and contractor-related expenses of $1.0 million was attributable to higher compensation expenses as compared to the 2015 period, primarily due to an increase in headcount.

The decrease in CTP-730 and JZP-386 expenses in the 2016 period of $2.7 million and $1.1 million, respectively, was attributable to the completion of clinical conduct under these programs in 2015. The decrease of $0.9 million in external costs for other programs in the 2016 period was primarily attributable to the discontinuation of our CTP-354 program and the completion of clinical evaluation of the CTP-499 program.

General and administrative expenses

General and administrative expenses were $14.4 million for the year ended December 31, 2016, compared to $13.1 million for the prior year. The increase of $1.3 million was primarily attributable to a $1.2 million increase in non-cash stock-based compensation expense.

Investment income

Investment income was $0.4 million for the year ended December 31, 2016, compared to $0.1 million for the prior year period. The increase is attributable to higher yielding investments, resulting in higher interest earned on our investments.

Interest and other expense

On October 1, 2015, our debt facility with Hercules Technology Growth Capital, Inc., or Hercules, matured. We have fulfilled all obligations under our debt facility, and as a result, no interest expense was recorded during the twelve months ended December 31, 2016, as compared to $0.3 million recorded during the twelve months ended December 31, 2015.

Provision for income taxes

No tax provision was recorded during the year ended December 31, 2016 due to the net loss generated. The Company recorded a tax provision of $0.4 million during the year ended December 31, 2015. The tax provision of $0.4 million is attributable to the federal limitation on alternative minimum tax net operating loss carryforwards.

Comparison of the years ended December 31, 2015 and 2014

The following table summarizes our results of operations for the years ended December 31, 2015 and 2014, together with the changes in those items in dollars.

	Year ended December 31,		
(in thousands)	**2015**	**2014**	**Change**
Revenue:			
License and research and development revenue	$ 6,574	$ 6,576	$ (2)
Other revenue	50,155	—	50,155
Milestone revenue	10,000	2,000	8,000
Total revenue	66,729	8,576	58,153
Operating expenses:			
Research and development	28,885	27,474	1,411
General and administrative	13,056	11,700	1,356
Total operating expenses	41,941	39,174	2,767
Income (Loss) from operations	24,788	(30,598)	55,386
Investment income	124	49	75
Interest and other expense	(309)	(1,150)	841
Income (Loss) before income taxes	24,603	(31,699)	56,302
Provision for income taxes	429	—	429
Net income (loss)	$ 24,174	$ (31,699)	$ 55,873

License and Research and Development Revenue

License revenue was $6.6 million for the year ended December 31, 2015 and for the prior year and is comprised of revenue recognized under our Celgene, Jazz Pharmaceuticals and Avanir collaboration agreements for services performed under these agreements during the years ended December 31, 2015 and 2014. During the years ended December 31, 2015 and 2014, services performed under our Celgene and Jazz Pharmaceuticals collaborations were primarily attributable to the performance of our Phase 1 clinical trials under these collaborations. Revenue recognized under our Avanir collaboration during the years ended December 31, 2015 and 2014 was attributable to certain intellectual property cost reimbursements. Our Phase 1 clinical trials under our Celgene and Jazz Pharmaceuticals collaborations were complete as of December 31, 2015.

Other Revenue

Other revenue recognized during the year ended December 31, 2015 was attributable to our patent assignment agreement with Auspex, whereby we received a one-time change in control payment of $50.2 million from Auspex, which was acquired by Teva Pharmaceutical Industries Ltd. in May 2015.

Milestone Revenue

Milestone revenue recognized during the year ended December 31, 2015 was attributable to an $8.0 million milestone payment earned upon completion of Phase 1 clinical evaluation for CTP-730 as well as a $2.0 million milestone payment earned as a result of the initial dosing in a Phase 3 clinical trial of AVP-786. During 2014, we earned a $2.0 million development milestone payment as a result of the initial dosing in a Phase 2 clinical trial of AVP-786.

Research and development expenses

The following table summarizes our external research and development expenses, by program, for the years ended December 31, 2015 and 2014, with our internal research expenses separately classified by category. Because Avanir is conducting the clinical development of AVP-786 at its expense, we made minimal investment in the program during these periods.

	Year ended December 31,	
(in thousands)	**2015**	**2014**
CTP-656 external costs	3,759	1,063
CTP-543 external costs	2,064	73
CTP-730 external costs	2,711	1,904
JZP-386 external costs	1,084	2,207
External costs for other programs	2,622	8,621
Employee and contractor-related expenses	13,507	10,523
Facility and other expenses	3,138	3,083
Total research and development expenses	$ 28,885	$ 27,474

Research and development expenses were $28.9 million for the year ended December 31, 2015, compared to $27.5 million for the prior year, an increase of $1.4 million. This increase was primarily due to increased expenses of $2.7 million, $2.0 million and $0.8 million, respectively, associated with our CTP-656, CTP-543 and CTP-730 development programs. The increased expenses for CTP-656 and CTP-730 were a result of expenses incurred in connection with Phase 1 clinical testing for each program during the year ended December 31, 2015. The increase of $2.0 million attributable to CTP-543 was primarily due to nonclinical development activities under the program. The increase of $3.0 million in employee and contractor-related expenses was primarily due to an increase in headcount.

The decrease of $6.0 million in external costs for other programs during the year ended December 31, 2015 was primarily attributable to the discontinuation of our CTP-354 program and the completion of the Phase 2 CTP-499 program, which resulted in decreased expenses of $5.5 million and $0.8 million, respectively. The decrease in JZP-386 expenses of $1.1 million was attributable to the completion of clinical conduct under this program during the year ended December 31, 2015.

General and administrative expenses

General and administrative expenses were $13.1 million for the year ended December 31, 2015, compared to $11.7 million for the prior year. The increase of $1.4 million was primarily attributable to a $0.8 million increase in non-cash stock-based compensation expense and a $0.4 million increase in cash compensation to employees, as a result of an increase in headcount.

Interest and other expense

Interest and other expense was $0.3 million for the year ended December 31, 2015, compared to $1.2 million for the prior year period. The decrease was primarily attributable to a decrease in interest expense associated with our debt facility with Hercules, which decreased by $0.7 million for the year ended December 31, 2015 compared to the prior year due to a lower principal balance outstanding.

Additionally, a $0.1 million expense was recognized during the year ended December 31, 2014 in connection with the re-measurement of the fair value of the redeemable convertible preferred stock warrant that we issued to Hercules in connection with draws under our debt facility. Upon completion of our IPO in February 2014, the warrant became exercisable for an aggregate of 70,796 shares of our common stock at an exercise price of $14.13 per share and the related warrant liability was reclassified to additional paid-in capital and will not be subject to re-measurement in future periods.

Provision for income taxes

The Company recorded a tax provision of $0.4 million during the year ended December 31, 2015. The tax provision of $0.4 million is attributable to the federal limitation on alternative minimum tax net operating loss carryforwards. No tax provision was recorded in the prior year period due to the net loss generated.

LIQUIDITY AND CAPITAL RESOURCES

We have incurred cumulative losses and negative cash flows from operations since our inception in April 2006, and as of December 31, 2016, we had an accumulated deficit of $171.9 million . Although we generated net income in fiscal year 2015 due to the one-time payment from Auspex, we anticipate that we will continue to incur losses for at least the next several years. We expect that our research and development and general and administrative expenses will continue to increase and, as a result, we will need additional capital to fund our operations, which we may raise through a combination of equity offerings, debt financings, additional collaborations and licensing arrangements, and other sources.

We have financed our operations to date primarily through the public offering and private placement of our equity, debt financing and funding from collaborations and patent assignments. During February 2014, we completed our initial public offering, or IPO, whereby we sold 6,649,690 shares of common stock at a price to the public of $14.00 per share, raising aggregate net proceeds of $83.1 million. During March 2015, we sold 3,300,000 shares of common stock through an underwritten public offering at a price to the public of $15.15 per share, raising aggregate net proceeds of $46.7 million.

In June 2015, we received proceeds of $50.2 million in connection with the change in control payment from Auspex, relating to Teva Pharmaceutical Industries Ltd.'s acquisition of Auspex, discussed further in Note 14 in the consolidated financial statements.

As of December 31, 2016 we had cash and cash equivalents and investments of $96.2 million . Cash in excess of immediate requirements is invested in accordance with our investment policy, primarily with a view to liquidity and capital preservation. Currently, our funds are held in U.S. government-backed securities and money market mutual funds consisting of U.S. government-backed securities.

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,		
(in thousands)	**2016**	**2015**	**2014**
Net cash provided by (used in):			
Operating activities	$ (45,343)	$ 23,061	$ (29,760)
Investing activities	(7,213)	14,569	(44,452)
Financing activities	601	41,484	77,970
Net (decrease) increase in cash and cash equivalents	$ (51,955)	$ 79,114	$ 3,758

Comparison of the years ended December 31, 2016, 2015 and 2014

Operating activities. The cash provided by or used for operating activities generally approximates our net (loss) income adjusted for non-cash items and changes in operating assets and liabilities. The cash provided by operating activities during the year ended December 31, 2015 was due to the receipt of $50.2 million from Auspex for a change in control payment. Excluding the cash received from Auspex in fiscal year 2015, cash used in operating activities was primarily driven by our research and development and general and administrative operating expenses in the fiscal years ended December 31, 2016, 2015 and 2014.

Investing activities. Net cash provided by or used for investing activities consisted of purchases of investments, purchases of fixed assets and proceeds from the maturity of investments. Net cash used to purchase investments for the years ended

December 31, 2016, 2015 and 2014 was $132.3 million, $163.0 million and $89.2 million, respectively. Net cash provided by maturities of investments for the years ended December 31, 2016, 2015 and 2014 was $125.9 million, $178.5 million and $45.5 million, respectively. Purchases of fixed assets for the years ended December 31, 2016, 2015 and 2014 was $0.8 million, $0.9 million and $0.8 million, respectively.

Financing activities. The cash provided by financing activities during the year ended December 31, 2016 was attributable to proceeds from the exercise of stock options. The cash provided by financing activities during the year ended December 31, 2015 was primarily due to the receipt of net public offering proceeds of $47.0 million in March 2015. The cash provided by financing activities during the year ended December 31, 2014 was primarily due to the receipt of net IPO proceeds of $86.6 million. Proceeds from the exercise of stock options during the years ended December 31, 2015 and 2014 were $1.8 million and $1.0 million, respectively. Cash payments of offering related expenses totaled $0.3 million and $1.4 million during the years ended December 31, 2015, 2014 respectively. Principal payments under our debt facility with Hercules totaled $7.2 million and $7.9 during the years ended December 31, 2015 and 2014, respectively. On October 1, 2015, we made our final payment to Hercules under the Loan and Security Agreement, discussed further in Note 15 in the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K.

Credit Facilities

In December 2011, we executed a Loan and Security Agreement with Hercules, which provided for up to $20.0 million in funding, to be made available in two tranches. We borrowed the first tranche of $7.5 million in December 2011 and the second tranche of $12.5 million in March 2012. On October 1, 2015, we made our final payment to Hercules, thereby fulfilling all obligations under the Loan and Security Agreement. Through the maturity date on October 1, 2015, each advance had an interest rate of 8.5%.

In connection with the December 2011 borrowing under the Loan and Security Agreement, we issued to Hercules a warrant to purchase an aggregate of 200,000 shares of Series C preferred stock with an exercise price of $2.50 per share. In connection with the March 2012 borrowing under the Loan and Security Agreement, the warrant we issued to Hercules automatically became exercisable for an additional 200,000 shares of Series C preferred stock. Upon completion of our IPO in February 2014 the warrant became exercisable for an aggregate of 70,796 shares of our common stock at an exercise price of $14.13 per share and the related warrant liability was reclassified to additional paid-in capital.

Operating capital requirements

We do not anticipate commercializing any of our product candidates for several years. Although we generated net income in 2015 due to the one-time payment from Auspex, 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 regulatory approvals for, our product candidates, and begin to commercialize any approved products for which we retain commercialization rights. We are subject to all of the risks incident in the development of new drug products, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business, as well as additional risks stemming from the unproven nature of deuterated drugs.

Based on our current expectations, including with respect to our development plans, we believe our existing cash and cash equivalents and investments as of December 31, 2016 will enable us to fund our operating expenses and capital expenditure requirements through the second quarter of 2018. Upon closing of the CTP-656 asset purchase agreement, we expect our cash will be sufficient to fund the Company into 2021 under our current operating plan. However, we will require additional capital for the further development of our existing product candidates and may also need to raise additional funds sooner to pursue other development activities related to additional product candidates.

To date, we have not generated any revenue from product sales. We do not expect to generate significant revenue from product sales unless and until we, or our collaborators, obtain marketing approval of and commercialize one of our current or future product candidates. Because our product candidates are in various stages of development and the outcome of these efforts is uncertain, we cannot estimate the actual amounts necessary to successfully complete development and commercialization of our product candidates or whether or when we will achieve profitability. 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, and begin to commercialize any approved products for which we retain commercialization rights.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings and additional collaborations, strategic alliances and licensing arrangements, and other arrangements. Except for any obligations of our collaborators to reimburse us for research and development expenses or to make milestone payments under our agreements with them, we do not have any additional committed external sources of funds. Additional capital may not be available on reasonable terms, if at all. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves. If we raise additional funds through the issuance of additional debt or equity securities, it could result in dilution to our existing stockholders, increased fixed payment obligations and these securities may have rights senior to those of our common stock. We may become subject to covenants under any future indebtedness that could limit our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends, which could adversely impact our ability to conduct our business.

Our expectation with respect to 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, including those discussed in the "Risk Factors" section of this Annual Report on Form 10-K. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. 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

The following table summarizes our contractual obligations at December 31, 2016:

(in thousands)	**Total**	**Less than 1 year**	**1 to 3 years**	**3 to 5 years**	**More than 5 years**
Operating lease obligations (1)	2,781	1,573	1,208	—	—
Total contractual obligations	$ 2,781	$ 1,573	$ 1,208	$ —	$ —

(1) *Consists of future lease payments under the operating lease for our office and laboratory space at 99 Hayden Avenue, Lexington, Massachusetts. The operating lease expires on September 30, 2018.*

We have an obligation to make a payment to GSK of up to $2.8 million if we commercialize CTP-499 or if we re-license or transfer rights to our CTP-499 program prior to a specified date in 2018.

We enter into contracts in the normal course of business with contract research organizations for clinical and nonclinical research studies, manufacturing, research supplies and other services and products for operating purposes. These contracts generally provide for termination on notice, and therefore are cancelable contracts and not included in the table of contractual obligations and commitments.

OFF-BALANCE SHEET ARRANGEMENTS

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

ITEM 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risk related to changes in interest rates. Our current investment policy is to maintain a diversified investment portfolio in U.S. government-backed securities and money market mutual funds consisting of U.S. government-backed securities. Our cash is deposited in and invested through highly rated financial institutions in North America. As of December 31, 2016 and 2015, we had $96.2 million and $142.2 million of cash, cash equivalents and investments, respectively. The fair value of cash equivalents and short-term investments is subject to change as a result of potential changes in market interest rates. Due to the short-term maturities of our cash equivalents and the low risk profile of these investments, an immediate 100 basis point change in interest rates at levels as of December 31, 2016 would not have a material effect on the fair market value of our cash equivalents and short term investments.

We contract with suppliers of raw materials and contract manufacturers internationally. Transactions with these providers are predominantly settled in U.S. dollars and, therefore, we believe that we have only minimal exposure to foreign currency exchange risks. We do not hedge against foreign currency risks.

Inflation generally affects us by increasing our cost of labor and clinical trial costs. We do not believe that inflation had a material effect on our business, financial condition or results of operations during the years ended December 31, 2016, 2015 or 2014.

ITEM 8. Financial Statements and Supplementary Data

INDEX TO FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders
Concert Pharmaceuticals, Inc.

We have audited the accompanying consolidated balance sheets of Concert Pharmaceuticals, Inc. (the Company) as of December 31, 2016 and 2015, and the related consolidated statements of operations and comprehensive income (loss), redeemable convertible preferred stock and stockholders' equity (deficit), and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Concert Pharmaceuticals, Inc. at December 31, 2016 and 2015, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 6, 2017

CONCERT PHARMACEUTICALS, INC.
CONSOLIDATED BALANCE SHEETS

	December 31,			
	2016		2015	
	(Amounts in thousands, except share and per share data)			
Assets				
Current assets:				
Cash and cash equivalents	$	40,555	$	92,510
Investments, available for sale		55,630		49,680
Interest receivable		164		181
Accounts receivable		27		70
Prepaid expenses and other current assets		1,353		1,667
Total current assets		97,729		144,108
Property and equipment, net		2,199		2,346
Restricted cash		400		400
Other assets		67		78
Total assets	$	100,395	$	146,932
Liabilities and stockholders' equity				
Current liabilities:				
Accounts payable	$	545	$	501
Accrued expenses and other liabilities		3,853		4,772
Income taxes payable		—		75
Deferred revenue, current portion		1,172		1,279
Total current liabilities		5,570		6,627
Deferred revenue, net of current portion		8,878		8,891
Deferred lease incentive, net of current portion		249		573
Deferred rent, net of current portion		104		206
Total liabilities		14,801		16,297
Commitments (Note 12)				
Stockholders' equity:				
Preferred stock, $0.001 par value per share; 5,000,000 shares authorized; no shares issued and outstanding in 2016 and 2015, respectively		—		—
Common stock, $0.001 par value per share; 100,000,000 shares authorized; 22,319,516 and 22,166,803 shares issued and 22,316,982 and 22,165,166 outstanding in 2016 and 2015, respectively		22		22
Additional paid-in capital		257,461		251,793
Accumulated other comprehensive loss		(7)		(18)
Accumulated deficit		(171,882)		(121,162)
Total stockholders' equity		85,594		130,635
Total liabilities and stockholders' equity	$	100,395	$	146,932

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME (LOSS)

	Year ended December 31,		
	2016	2015	2014
	(Amounts in thousands, except per share data)		
Revenue:			
License and research and development revenue	$ 174	$ 6,574	$ 6,576
Other revenue (Note 14)	—	50,155	—
Milestone revenue	—	10,000	2,000
Total revenue	174	66,729	8,576
Operating expenses:			
Research and development	36,983	28,885	27,474
General and administrative	14,358	13,056	11,700
Total operating expenses	51,341	41,941	39,174
(Loss) Income from operations	(51,167)	24,788	(30,598)
Investment income	447	124	49
Interest and other expense	—	(309)	(1,150)
(Loss) Income before income taxes	(50,720)	24,603	(31,699)
Provision for income taxes	—	429	—
Net (loss) income	$ (50,720)	$ 24,174	$ (31,699)
Other comprehensive income (loss):			
Unrealized income (loss) on investments	11	(4)	(18)
Comprehensive (loss) income	$ (50,709)	$ 24,170	$ (31,717)
Reconciliation of net (loss) income to net (loss) income applicable to common stockholders:			
Net (loss) income	$ (50,720)	$ 24,174	$ (31,699)
Accretion on redeemable convertible preferred stock	—	—	(55)
Net (loss) income applicable to common stockholders—basic and diluted	$ (50,720)	$ 24,174	$ (31,754)
Net (loss) income per share applicable to common stockholders—basic	$ (2.28)	$ 1.14	$ (2.00)
Net (loss) income per share applicable to common stockholders—diluted	$ (2.28)	$ 1.09	$ (2.00)
Weighted-average number of common shares used in net (loss) income per share applicable to common stockholders—basic	22,233	21,152	15,842
Weighted-average number of common shares used in net (loss) income per share applicable to common stockholders—diluted	22,233	22,267	15,842

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF REDEEMABLE CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)

	Redeemable convertible preferred stock		Common Stock			Additional paid-in capital	Accumulated other comprehensive income	Accumulated deficit	Total stockholders' equity (deficit)
	Shares	Carrying value	Issued	In Treasury	Amount				
					(in thousands)				
Balance at December 31, 2013	56,047	$ 112,244	1,298	—	$ 1	$ 1,528	$ 4	$ (113,637)	$ (112,104)
Accretion of redeemable convertible preferred stock to redemption value	—	55	—	—	—	(55)	—	—	(55)
Proceeds from IPO, net of underwriting discounts and offering expenses	—	—	6,650		7	83,112			83,119
Conversion of preferred stock into common stock	(56,047)	(112,299)	9,920		10	112,289			112,299
Reclassification of warrant	—	—				581			581
Exercise of stock options	—	—	366	—	—	1,009	—	—	1,009
Unrealized gain (loss) on short-term investments	—	—					(18)		(18)
Stock-based compensation expense	—	—	—	—	—	1,693	—	—	1,693
Net loss	—	—	—	—	—	—	—	(31,699)	(31,699)
Balance at December 31, 2014	—	$ —	18,234	—	$ 18	$ 200,157	$ (14)	$ (145,336)	$ 54,825
Proceeds from public offering of common stock, net of underwriting discounts and offering expenses	—	—	3,300	—	3	46,682	—	—	46,685
Exercise of stock options	—	—	633	2	1	1,843	—	—	1,844
Unrealized gain (loss) on short-term investments	—	—	—	—	—	—	(4)	—	(4)
Stock-based compensation expense	—	—	—	—	—	2,981	—	—	2,981
Income tax benefit from option exercises						130			130
Net loss	—	—	—	—	—		—	24,174	24,174
Balance at December 31, 2015	—	$ —	22,167	2	$ 22	$ 251,793	$ (18)	$ (121,162)	$ 130,635
Exercise of stock options	—	—	153	1	—	601	—	—	601
Unrealized gain (loss) on short-term investments	—	—	—	—	—	—	11	—	11
Stock-based compensation expense	—	—	—	—	—	5,067	—	—	5,067
Net income	—	—	—	—	—	—	—	(50,720)	(50,720)
Balance at December 31, 2016	—	$ —	22,320	3	$ 22	$ 257,461	$ (7)	$ (171,882)	$ 85,594

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year ended December 31,		
	2016	2015	2014
	(in thousands)		
Operating activities			
Net (loss) income	$ (50,720)	$ 24,174	$ (31,699)
Adjustments to reconcile net (loss) income to net cash (used in) provided by operating activities:			
Depreciation and amortization	893	785	1,052
Stock-based compensation expense	5,067	2,981	1,693
Accretion of premiums and discounts on investments	504	715	833
Amortization of discount on loan payable	—	74	98
Amortization of deferred financing costs	—	29	38
Re-measurement of warrant to purchase redeemable securities	—	—	117
Amortization of deferred lease incentive	(315)	(308)	(367)
Loss on disposal of asset	2	4	—
Changes in operating assets and liabilities:			
Accounts receivable	43	951	(851)
Interest receivable	17	81	(170)
Prepaid expenses and other current assets	314	(491)	(137)
Restricted cash	—	—	306
Other assets	11	23	82
Accounts payable	44	(90)	(32)
Accrued expenses and other liabilities	(957)	(223)	2,863
Landlord lease incentive	—	—	350
Income taxes payable	(75)	75	—
Deferred rent	(51)	(68)	(126)
Deferred revenue	(120)	(5,651)	(3,810)
Net cash (used in) provided by operating activities	(45,343)	23,061	(29,760)
Investing activities			
Purchases of property and equipment	(770)	(868)	(804)
Purchases of investments	(132,344)	(163,025)	(89,188)
Maturities of investments	125,901	178,462	45,540
Net cash (used in) provided by investing activities	(7,213)	14,569	(44,452)
Financing activities			
Principal payments on loan payable	—	(7,175)	(7,916)
Repayment of leasehold improvement loan	—	—	(266)
Proceeds from public offering of common stock, net of underwriting discounts and commissions	—	46,995	86,579
Proceeds from exercise of stock options	601	1,844	1,009
Income tax benefit from exercise of stock options	—	130	—
Payment of public offering costs	—	(310)	(1,436)
Net cash provided by (used in) financing activities	601	41,484	77,970
Net increase in cash and cash equivalents	(51,955)	79,114	3,758
Cash and cash equivalents at beginning of period	92,510	13,396	9,638
Cash and cash equivalents at end of period	$ 40,555	$ 92,510	$ 13,396
Supplemental cash flow information:			
Cash paid for income taxes	$ 85	$ 225	$ —
Cash paid for interest	$ —	$ 287	$ 992
Purchases of property and equipment unpaid at period end	$ 20	$ 42	$ 60

See accompanying notes.

1. Nature of Business

Concert Pharmaceuticals, Inc., or Concert or the Company, was incorporated on April 12, 2006 as a Delaware corporation with operations based in Lexington, Massachusetts. The Company is a clinical stage biopharmaceutical company that applies its extensive knowledge of deuterium chemistry to discover and develop novel small molecule drugs. The Company’s approach typically starts with approved drugs that the Company believes can be improved with deuterium substitution to provide better pharmacokinetic or metabolic properties, enhancing clinical safety, tolerability or efficacy. The Company believes this approach may enable drug discovery and clinical development that is more efficient and less expensive than conventional small molecule drug research and development. The Company’s pipeline includes multiple clinical-stage candidates and a number of preclinical compounds that it is currently assessing.

In March 2015, the Company sold 3,300,000 shares of common stock in a public offering at a price to the public of $15.15 per share, resulting in net proceeds to the Company of approximately $46.7 million after deducting underwriting discounts and commissions and offering expenses. In June 2015, the Company received a one-time payment of $50.2 million from Auspex Pharmaceuticals, Inc., or Auspex, pursuant to a patent assignment agreement between Concert and Auspex. Concert became eligible to receive the payment due to a change of control of Auspex, which was acquired by Teva Pharmaceutical Industries Ltd. in May 2015 (see Note 14).

The Company had cash and cash equivalents and investments of $96.2 million at December 31, 2016. The Company believes that its cash and cash equivalents and investments at December 31, 2016 will be sufficient to allow the Company to fund its current operating plan for at least the next twelve months from the date of issuance of the financial statements.

The Company has incurred net losses in each year from its inception in 2006, except for fiscal year 2015. Since its inception, the Company has generated an accumulated deficit of $171.9 million through December 31, 2016. The Company's operating results may fluctuate significantly from year to year, depending on the timing and magnitude of clinical trial and other development activities under its current development programs. Substantially all the Company's net losses have resulted from costs incurred in connection with its research and development programs and from general and administrative costs associated with its operations. The Company expects to continue to incur significant expenses and increasing operating losses for at least the next several years. The Company may pursue additional cash resources through public or private financings and by establishing collaborations with or licensing its technology to other companies.

On March 3, 2017, the Company entered into an Asset Purchase Agreement with Vertex, through Vertex Pharmaceuticals (Europe) Limited, pursuant to which the Company agreed to sell and assign, subject to the satisfaction or waiver of certain conditions, the cystic fibrosis assets of the Company, including CTP-656, for up to $250 million . Additional information concerning the sale of CTP-656 is discussed further in Note 18.

The Company is subject to risks common to companies in the biotechnology industry, including, but not limited to, risks of failure or unsatisfactory results of nonclinical studies and clinical trials, the need to obtain additional financing to fund the future development of its pipeline, the need to obtain marketing approval for its product candidates, the need to successfully commercialize and gain market acceptance of its product candidates, dependence on key personnel, protection of proprietary technology, compliance with government regulations, development by competitors of technological innovations and ability to transition from pilot-scale manufacturing to large-scale production of products.

Unless otherwise indicated, all amounts are in thousands except share and per share amounts.

2. Basis of Presentation and Significant Accounting Policies

Basis of Presentation

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America, or GAAP. Management has determined that the Company operates in one segment: the development of pharmaceutical products on its own behalf or in collaboration with others. All long-lived assets of the Company reside in the United States.

The accompanying consolidated financial statements include the accounts of Concert Pharmaceuticals, Inc. and its wholly owned subsidiaries. All intercompany transactions and balances have been eliminated.

The Company considers events or transactions that occur after the balance sheet date but before the financial statements are issued to provide additional evidence relative to certain estimates or to identify matters that require additional disclosure. See Note 18 for the subsequent event related to the Asset Purchase Agreement the Company entered into with Vertex.

Estimates and Uncertainties

The preparation of the consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, equity, revenue, expenses and the disclosure of contingent assets and liabilities and the Company's ability to continue as a going concern. In preparing the consolidated financial statements, management used estimates in the following areas, among others: revenue recognition for multiple-element revenue arrangements; stock-based compensation expense; accrued expenses; and the evaluation of the existence of conditions and events that raise substantial doubt regarding the Company's ability to continue as a going concern. Actual results could differ from those estimates.

Cash, Cash Equivalents and Investments

Cash equivalents include all highly liquid investments maturing within 90 days from the date of purchase. Investments consist of securities with original maturities greater than 90 days when purchased. The Company classifies these investments as available-for-sale and records them at fair value in the accompanying consolidated balance sheets. Unrealized gains or losses are included in accumulated other comprehensive income (loss). Premiums or discounts from par value are amortized to investment income over the life of the underlying investment.

Although available to be sold to meet operating needs or otherwise, securities are generally held through maturity. The cost of securities sold is determined based on the specific identification method for purposes of recording realized gains and losses. During 2016 and 2015, there were no realized gains or losses on sales of investments, and no investments were adjusted for other than temporary declines in fair value.

Fair Value of Financial Measurements

The Company has certain financial assets and liabilities that are recorded at fair value which have been classified as Level 1, 2 or 3 within the fair value hierarchy as described in the accounting standards for fair value measurements:

- Level 1—quoted prices for identical instruments in active markets;
- Level 2—quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets; and
- Level 3—valuations derived from valuation techniques in which one or more significant value drivers are unobservable.

For additional information related to fair value measurements, please read Note 3 to the consolidated financial statements.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentration of credit risk consist principally of money market funds and investments and accounts receivable. The Company has not experienced any credit losses in these accounts and does not believe it is exposed to any significant credit risk on these funds. The Company has no foreign exchange contracts, option contracts or other foreign exchange hedging arrangements.

At December 31, 2016 and 2015, substantially all of the Company's cash was deposited in accounts at two financial institutions, thus limiting the amount of credit exposure to any one financial institution. These amounts at times may exceed federally insured limits.

Accounts receivable generally represent amounts due from collaboration partners. The Company monitors economic conditions to identify facts or circumstances that may indicate that any of its accounts receivable are at risk of collection.

Property and Equipment

Property and equipment are recognized at cost and depreciated over their estimated useful lives using the straight-line method. Repair and maintenance costs are expensed as incurred, whereas major improvements are capitalized as additions to property and equipment. Potential impairment is assessed when there is evidence that events or circumstances indicate that the carrying amount of an asset may not be recovered. No such impairment losses have been recorded through December 31, 2016.

Rent Expense

The Company’s operating lease for its Lexington, Massachusetts facility provides for scheduled annual rent increases throughout the lease term. The Company recognizes the effects of the scheduled rent increases on a straight-line basis over the full term of the lease, which expires in 2018 . Additionally, the Company has received certain lease incentives in connection with its Lexington, Massachusetts facility lease, which are recognized as a reduction to rent expense over the remaining lease term. Refer to Note 12 for additional details regarding the Company’s operating lease.

Rent expense for the years ended December 31, 2016, 2015 and 2014 was $1.2 million , $1.2 million and $1.0 million , respectively.

Contingencies

The Company records liabilities for legal and other contingencies when information available to the Company indicates that it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Legal costs in connection with legal and other contingencies are expensed as costs are incurred.

Revenue Recognition

The Company has primarily generated revenue through arrangements with collaborators and nonprofit organizations for the development and commercialization of product candidates.

The Company recognizes revenue in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) Topic 605, *Revenue Recognition* (ASC 605). Accordingly, revenue is recognized when all of the following criteria are met:

- Persuasive evidence of an arrangement exists;
- Delivery has occurred or services have been rendered;
- The seller’s price to the buyer is fixed or determinable; and
- Collectability is reasonably assured.

Amounts received prior to satisfying the revenue recognition criteria are recognized as deferred revenue in the Company’s consolidated balance sheets. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, current portion. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portion.

The Company’s revenue is currently generated through collaborative research and development and licensing agreements. The terms of these agreements typically contain multiple elements, or deliverables, which may include licenses, or options to obtain licenses, to product candidates, referred to as exclusive licenses, as well as research and development activities to be performed by the Company on behalf of the collaboration partner related to the licensed product candidates. The terms of these agreements may include payments to the Company of one or more of the following: a nonrefundable, upfront payment; milestone payments; payment of license exercise or option fees with respect to product candidates; fees for research and development services rendered; and royalties on commercial sales of licensed product candidates, if any. To date, the Company has received upfront payments, several milestone payments and certain research and development service payments but has not received any license exercise or option fees or earned royalty revenue as a result of product sales.

When evaluating multiple element arrangements, the Company considers whether the deliverables under the arrangement represent separate units of accounting. This evaluation requires subjective determinations and requires management to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. In determining the units of accounting, management evaluates certain criteria, including whether the deliverables have standalone value, based on the consideration of the relevant facts and circumstances for each arrangement. The consideration received is allocated among the separate units of accounting using the relative selling price method, and the applicable revenue recognition criteria are applied to each of the separate units.

The Company determines the estimated selling price for deliverables within each agreement using vendor-specific objective evidence, or VSOE, of selling price, if available, third-party evidence, or TPE, of selling price if VSOE is not available, or best estimate of selling price, or BESP, if neither VSOE nor TPE is available. Determining the BESP for a deliverable requires significant judgment. The Company has used its BESP to estimate the selling price for licenses to the Company's proprietary technology, since the Company does not have VSOE or TPE of selling price for these deliverables. In those circumstances where the Company utilizes BESP to determine the estimated selling price of a license to the Company's proprietary technology, the Company considers market conditions as well as entity-specific factors, including those factors contemplated in negotiating the agreement, estimated development costs, and the probability of success and the time needed to commercialize a product candidate pursuant to the license. In validating the Company's BESP, the Company evaluates whether changes in the key assumptions used to determine the BESP will have a significant effect on the allocation of arrangement consideration between multiple deliverables.

The Company's multiple-element revenue arrangements may include the following:

Exclusive Licenses . The deliverables under the Company's collaboration agreements generally include exclusive licenses to develop, manufacture and commercialize one or more deuterated compounds. To account for this element of the arrangement, management evaluates whether the exclusive license has standalone value from the undelivered elements based on the consideration of the relevant facts and circumstances of each arrangement, including the research and development capabilities of the collaboration partner. The Company may recognize the arrangement consideration allocated to licenses upon delivery of the license if facts and circumstances indicate that the license has standalone value from the undelivered elements, which generally include research and development services. The Company defers arrangement consideration allocated to licenses if facts and circumstances indicate that the delivered license does not have standalone value from the undelivered elements.

When management believes the license does not have stand-alone value from the other deliverables to be provided in the arrangement, the Company generally recognizes revenue attributed to the license on a straight-line basis over the Company's contractual or estimated performance period, which is typically the term of the Company's research and development obligations. If management cannot reasonably estimate when the Company's performance obligation ends, then revenue is deferred until management can reasonably estimate when the performance obligation ends. The periods over which revenue should be recognized are subject to estimates by management and may change over the course of the research and development and licensing agreement. Such a change could have a material impact on the amount of revenue the Company records in future periods.

Research and Development Services . The deliverables under the Company's collaboration and license agreements may include deliverables related to research and development services to be performed by the Company on behalf of the collaboration partner.

Payments or reimbursements resulting from the Company's research and development efforts are recognized as the services are performed and presented on a gross basis because the Company is the principal for such efforts, so long as there is persuasive evidence of an arrangement, the fee is fixed or determinable, and collection of the related amount is reasonably assured. If there is no discernible pattern of performance and/or objectively measurable performance measures do not exist, then the Company recognizes revenue on a straight-line basis over the period it is expected to complete its performance obligations. Conversely, if the pattern of performance in which the service is provided to the customer can be determined and objectively measurable performance measures exist, then the Company recognizes revenue under the arrangement using the proportional performance method. Revenue recognized is limited to the lesser of the cumulative amount of payments received or the cumulative amount of revenue earned as of the period end date.

Option Agreements . The Company's arrangements may provide a collaborator with the right to select a deuterated compound for licensing within an initial pre-defined selection period. Under these agreements, a fee would be due to the Company upon the exercise of an option to acquire a license. The accounting for option arrangements is dependent on the nature of the option granted to the collaboration partner. An option is considered substantive if, at the inception of the arrangement, the Company is at risk as to whether the collaboration partner will choose to exercise the option to secure exclusive licenses. Factors that the Company considers in evaluating whether an option is substantive include the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising the option, the cost to exercise the option relative to the total upfront consideration and the additional financial commitments or economic penalties imposed on the collaborator as a result of exercising the option. For arrangements under which an option to secure a license is considered substantive, the Company does not consider the license underlying the option to be a deliverable at the inception of the arrangement. For arrangements under which the option to secure a license is not considered substantive, the Company considers the license underlying the option to be a deliverable at the inception of the arrangement and, upon delivery of the license, would apply the multiple-element revenue arrangement criteria to the license and any other deliverables to determine the appropriate revenue recognition. A significant and incremental discount included in an otherwise substantive option is considered to be a separate deliverable at the inception of the arrangement.

Milestone Revenue . The Company's collaboration agreements generally include contingent milestone payments related to specified development milestones, regulatory milestones and sales-based milestones. Development milestones are typically payable when a product candidate initiates or advances in clinical trial phases or achieves defined clinical events such as proof-of-concept. Regulatory milestones are typically payable upon submission for marketing approval with regulatory authorities or upon receipt of actual marketing approvals for a compound, approvals for additional indications, upon commercial launch or upon the first commercial sale. Sales-based milestones are typically payable when annual sales reach specified levels.

At the inception of each arrangement that includes milestone payments, the Company evaluates whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether (a) the consideration is commensurate with either (i) the entity's performance to achieve the milestone or (ii) the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the entity's performance to achieve the milestone; (b) the consideration relates solely to past performance; and (c) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. The Company evaluates factors such as the scientific, regulatory, commercial and other risks that must be overcome to achieve the respective milestone, the level of effort and investment required to achieve the respective milestone and whether the milestone consideration is reasonable relative to all deliverables and payment terms in the arrangement in making this assessment. Milestones that are not considered substantive are accounted for as license payments and recognized on a straight-line basis over the remaining period of performance.

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 nonclinical 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.

Accounting for Stock-Based Compensation

The Company issues stock options to certain employees, officers and directors. The Company accounts for stock compensation using the fair value method, which results in the recognition of compensation expense over the vesting period of the awards. See Note 9 for additional information.

Prior to the Company's IPO, the estimated fair value of its common stock on each stock option grant date was determined by the Company's board of directors based on contemporaneous and retrospective valuation estimates provided by management and prepared in accordance with the framework of the American Institute of Certified Public Accountants' Technical Practice Aid, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation* , as well as independent third-party valuations. The Company's valuations of its common stock were based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry sector and the prices at which it sold shares of preferred stock, the superior rights and preferences of securities senior to its common stock at the time of each grant and the likelihood of achieving a liquidity event such as an IPO. Following the Company's IPO, the fair value of the shares of common stock underlying stock options has been the closing price on the option grant date.

Income Taxes

The Company provides deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the Company's financial statement carrying amounts and the tax basis of assets and liabilities using enacted tax rates expected to be in effect in the years in which the differences are expected to reverse. A valuation allowance is provided to reduce the deferred tax assets to the amount that will more likely than not be realized.

The Company evaluates tax positions taken, or expected to be taken, in the course of preparing its tax returns to determine whether the tax positions are "more likely than not" of being sustained by the applicable tax authority. Tax positions not deemed to meet the more-likely-than-not threshold would be recognized as a tax expense.

Guarantees

As permitted under Delaware law, the Company indemnifies its officers and directors for certain events or occurrences while the officer or director is, or was, serving at the Company's request in such capacity. The term of the indemnification is for the officer's or director's lifetime. The maximum potential amount of future payments the Company could be required to make is unlimited; however, the Company has directors' and officers' insurance coverage that limits its exposure and enables it to recover a portion of any future amounts paid.

The Company leases office space under a non-cancelable operating lease which is further described in Note 12, Commitments. The Company has a standard indemnification arrangement under the lease that requires it to indemnify the landlord against all costs, expenses, fines, suits, claims, demands, liabilities, and actions directly resulting from any breach, violation, or non-performance of any covenant or condition of the Company's lease.

As of December 31, 2016 and 2015, the Company had not experienced any material losses related to these indemnification obligations, and no material claims with respect thereto were outstanding. The Company does not expect significant claims related to these indemnification obligations and, consequently, concluded that the fair value of these obligations is negligible, and no related reserves were established.

Comprehensive (Loss) Income

Comprehensive (loss) income is comprised of net (loss) income and other comprehensive income or loss. Other comprehensive income or loss consists of unrealized gains and losses on investments.

Pending and Recently Adopted Accounting Pronouncements

In May 2014, the Financial Accounting Standard Board, or FASB, issued Accounting Standards Update, or ASU, No. 2014-09, Revenue from Contracts with Customers (Topic 606), or ASU 2014-09, which stipulates that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To achieve this core principle, ASU 2014-09 provides that an entity should apply the following steps: (1) identify the contract(s) with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract and (5) recognize revenue when (or as) the entity satisfies a performance obligation. This update will be effective for the Company beginning in the first quarter of fiscal 2018 as a result of the FASB's one year deferral of the effective date for this standard. The amendments may be applied retrospectively to each prior period (full retrospective) or retrospectively with the cumulative effect recognized as of the date of initial application (modified retrospective). The Company will adopt ASU 2014-09 in the first quarter of 2018 and apply the full retrospective approach. The Company is currently evaluating the effect of adopting the requirements of ASU 2014-09 as it relates to the accounting for its collaboration arrangements with Celgene, Jazz and Avanir, and its patent assignment agreement with Auspex.

In August 2014, the FASB issued ASU No. 2014-15, Disclosure of Uncertainties About an Entity's Ability to Continue as a Going Concern, or ASU 2014-15. ASU 2014-15 amends FASB Accounting Standards Codification, or ASC, 205-40, Presentation of Financial Statements – Going Concern, by providing guidance on determining when and how reporting entities must disclose going-concern uncertainties in their financial statements, including requiring management to perform interim and annual assessments of an entity's ability to continue as a going concern within one year of the date of issuance of the entity's financial statements and providing certain disclosures if there is substantial doubt about the entity's ability to continue as a going concern. The Company is required to apply the requirements of ASU 2014-15 in its annual financial statements for the period ended December 31, 2016 and for interim financial statements beginning in the first quarter of fiscal 2017. With respect to the 2016 annual financial statements, the Company did not identify any conditions or events that raise substantial doubt about its ability to continue as a going concern within one year after the date the financial statements are issued.

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842), or ASU 2016-02. ASU 2016-02 requires lessees to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with terms of more than 12 months. ASU 2016-02 also will require certain qualitative and quantitative disclosures designed to give financial statement users information on the amount, timing, and uncertainty of cash flows arising from leases. ASU 2016-02 will be effective for the Company on January 1, 2019, with early adoption permitted. The Company is currently evaluating the impact ASU 2016-02 will have on its financial statements.

In March 2016, the FASB issued ASU No. 2016-09, Compensation-Stock Compensation-Improvements to Employee Share-Based Payment Accounting, or ASU 2016-09. This update simplifies several aspects of the accounting for share-based compensation arrangements, including accounting for income taxes, forfeitures and statutory tax withholding requirements as well as classification of related amounts on the statement of cash flows. The ASU is effective for fiscal years beginning after December 15, 2016, with early adoption permitted. The Company has evaluated this ASU and does not expect it to have a material effect on its financial statements and related disclosures.

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments-Credit Losses (Topic 326)-Measurement of Credit Losses on Financial Instruments, or ASU 2016-13. The new standard requires entities to measure all expected credit losses for financial assets held at the reporting date based on historical experience, current conditions and reasonable and supportable forecasts. ASU 2016-13 will become effective for the Company for fiscal years beginning after December 15, 2019, with early adoption permitted. The Company is currently evaluating the impact ASU 2016-13 will have on its financial statements and related disclosures.

3. Fair Value Measurements

The tables below present information about the Company’s financial assets and liabilities that are measured and carried at fair value as of December 31, 2016 and 2015 (in thousands) and indicate the level within the fair value hierarchy where each measurement is classified.

	Level 1	Level 2	Level 3	Total
December 31, 2016				
Cash equivalents:				
Money market funds	26,257	—	—	26,257
U.S. Treasury obligations	—	1,001	—	1,001
Investments, available for sale:				
U.S. Treasury obligations	10,034	5,503	—	15,537
Government agency securities	24,545	15,548	—	40,093
Total	$ 60,836	$ 22,052	$ —	$ 82,888

	Level 1	Level 2	Level 3	Total
December 31, 2015				
Cash equivalents:				
Money market funds	52,221	—	—	52,221
U.S. Treasury obligations	5,001	—	—	5,001
Government agency securities	—	34,390	—	34,390
Investments, available for sale:				
U.S. Treasury obligations	9,781	—	—	9,781
Government agency securities	19,578	20,321	—	39,899
Total	$ 86,581	$ 54,711	$ —	$ 141,292

4. Cash, Cash Equivalents and Investments, Available for Sale

Cash, cash equivalents and investments, available for sale included the following at December 31, 2016 and December 31, 2015 (in thousands):

	Average maturity	Amortized cost	Unrealized gains	Unrealized losses	Fair value
December 31, 2016					
Cash		$ 13,297	—	—	$ 13,297
Money market funds		26,257	—	—	26,257
U.S. Treasury obligations	31 days	1,001	—	—	1,001
Cash and cash equivalents		$ 40,555	$ —	$ —	$ 40,555
U.S. Treasury obligations	125 days	$ 15,534	4	(1)	$ 15,537
Government agency securities	140 days	40,103	1	(11)	40,093
Investments, available for sale		$ 55,637	$ 5	$ (12)	$ 55,630

	Average maturity	Amortized cost	Unrealized gains	Unrealized losses	Fair value
December 31, 2015					
Cash		$ 898	—	—	$ 898
Money market funds		52,221	—	—	52,221
U.S. Treasury obligations	31 days	5,002	—	(1)	5,001
Government agency securities	41 days	34,389	1	—	34,390
Cash and cash equivalents		$ 92,510	$ 1	$ (1)	$ 92,510
U.S. Treasury obligations	42 days	$ 9,785	—	(4)	$ 9,781
Government agency securities	104 days	39,913	1	(15)	39,899
Investments, available for sale		$ 49,698	$ 1	$ (19)	$ 49,680

5. Restricted Cash

At December 31, 2016 and 2015, $0.4 million of the Company’s cash is restricted by a bank as collateral for a stand-by letter of credit issued by the Company to its landlord in connection with the lease of the Company’s Lexington, Massachusetts facility.

6. Property and Equipment

Property and equipment consists of the following at December 31, 2016 and 2015 (in thousands):

	Estimated useful life (in years)	December 31, 2016	December 31, 2015
Laboratory equipment	5	$ 2,128	$ 1,769
Computer, telephone and office equipment	3	207	211
Software	3	192	84
Leasehold improvements	Lesser of useful life or remaining lease term	6,548	6,496
		9,075	8,560
Less accumulated depreciation and amortization		(6,876)	(6,214)
		$ 2,199	$ 2,346

Depreciation and amortization expense was charged to operations in the amounts of $0.9 million , $0.8 million and $1.1 million for the years ended December 31, 2016, 2015 and 2014, respectively.

7. Accrued Expenses and Other Liabilities

Accrued expenses and other liabilities consist of the following (in thousands):

	December 31, 2016	December 31, 2015
Accrued professional fees and other	$ 487	$ 732
Employee compensation and benefits	2,010	2,503
Research and development expenses	930	1,171
Deferred lease incentive, current portion	324	315
Deferred rent, current portion	102	51
	$ 3,853	$ 4,772

8. Redeemable Convertible Preferred Stock

From time to time prior to the Company’s IPO, the Company issued Series A, Series B, Series C and Series D redeemable convertible preferred stock, or collectively, the Convertible Preferred Stock. In connection with the closing of the Company’s IPO on February 19, 2014, all of the outstanding Convertible Preferred Stock converted into 9,919,821 shares of common stock.

9. Stock Compensation

Stock incentive plans

The Company previously sponsored an Amended and Restated 2006 Stock Option and Grant Plan, or the 2006 Plan, which provided for the issuance of shares of common stock in the form of incentive stock options, nonstatutory stock options, awards of stock and direct stock purchase opportunities to directors, officers, employees and consultants of the Company. The 2006 Plan was replaced by the Company’s 2014 Stock Incentive Plan, or the 2014 Plan, which became effective in February 2014. The 2014 Plan provides for the grant of incentive stock options, nonstatutory stock options, restricted stock awards, restricted stock units, stock appreciation rights and other stock-based awards. In addition, the 2014 Plan includes an “evergreen provision” that allows for an annual increase in the number of shares of common stock available for issuance under the 2014 Plan. Effective January 1, 2017, 892,679 shares were added to the 2014 Plan for future issuance pursuant to this evergreen provision.

The 2006 Plan has no shares remaining available for grant, although existing stock options granted under the 2006 Plan remain outstanding. As of December 31, 2016, 1,701,451 shares were available for future grant under the 2014 Plan.

Stock options

Stock options are granted with an exercise price equal to the closing market price of the Company’s common stock on the date of grant. Stock options generally vest ratably over three or four years and have contractual terms of ten years. Stock options are valued using the Black-Scholes-Merton option valuation model and compensation cost is recognized based on such fair value over the period of vesting.

The following table provides certain information related to the Company's outstanding stock options:

	Year ended December 31,		
	2016	2015	2014
	(in thousands, except per share data)		
Weighted average fair value of options granted, per option	$ 10.42	$ 10.27	$ 6.69
Aggregate grant date fair value of options vested during the year	$ 4,614	$ 3,470	$ 629
Total cash received from exercises of stock options	$ 601	$ 1,844	$ 1,009
Total intrinsic value of stock options exercised	$ 1,160	$ 9,126	$ 2,363

The weighted average fair value of options granted in the years ended December 31, 2016, 2015 and 2014, reflect the following weighted-average assumptions:

	Year ended December 31,		
	2016	2015	2014
Expected volatility	78.29%	73.38%	80.94%
Expected term	6.0 years	6.0 years	6.0 years
Risk-free interest rate	1.36%	1.69%	1.90%
Expected dividend yield	—%	—%	—%

Expected volatility. Because there had been no public market for the Company’s common stock prior to its IPO, the Company believes that it has insufficient data from its limited public trading history to appropriately utilize company-specific historical and implied volatility information. Accordingly, the Company utilizes data from a representative group of publicly traded companies to estimate expected stock price volatility. The Company selected representative companies from the biopharmaceutical industry with similar characteristics as the Company, including stage of product development and therapeutic focus.

Expected term. The expected term of awards represents the period of time that the awards are expected to be outstanding. The expected term was determined using the simplified method as prescribed by the Securities and Exchange Commission Staff Accounting Bulletin No. 107, *Share-Based Payment* as the Company does not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term of stock options granted to employees.

Risk-free interest rate. For the years ended December 31, 2016, 2015 and 2014, the risk-free interest rate was estimated using an average of treasury bill interest rates over a period commensurate with the expected term of the option at the time of grant.

Expected dividend yield. The expected dividend yield is zero as the Company has not paid any dividends to date and has no current intention of paying cash dividends.

Forfeiture rate. The Company is required to estimate potential forfeiture of stock grants and adjust compensation cost recorded accordingly. The estimate of forfeitures is adjusted over the requisite service period to the extent that actual forfeitures differ, or are expected to differ, from such estimates. Changes in estimated forfeitures are recognized through a cumulative catch-up in the period of change and impact the amount of stock compensation expense to be recognized in future periods. For the years ended December 31, 2016, 2015 and 2014, the Company assumed forfeiture rates of approximately 6% , 6% and 5% , respectively.

The following is a summary of option activity under the 2006 Plan and 2014 Plan:

	Number of Option Shares	Weighted Average Exercise Price per Share	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
			(In years)	(In thousands)
Outstanding at December 31, 2015	2,244,177	$ 8.10		
Granted	970,950	$ 15.41		
Exercised	(152,713)	$ 3.99		
Forfeited or expired	(108,453)	$ 14.28		
Outstanding at December 31, 2016	2,953,961	$ 10.49	6.82	6,376
Exercisable at December 31, 2016	1,706,310	$ 8.17	5.62	5,857
Vested and expected to vest at December 31, 2016 (1)	2,862,624	$ 10.37	6.75	6,348

(1) Options expected to vest consist of options scheduled to vest in the future less expected forfeitures.

Stock-based compensation expense

Total compensation cost recognized for all stock-based compensation awards in the consolidated statements of operations and comprehensive income (loss) is as follows (in thousands):

	For the Year Ended December 31,		
	2016	2015	2014
Research and development	$ 2,147	$ 1,251	$ 802
General and administrative	2,920	1,730	891
Total stock-based compensation expense	$ 5,067	$ 2,981	$ 1,693

As of December 31, 2016 there was $10.5 million of total unrecognized compensation cost related to unvested options. Total unrecognized compensation cost will be adjusted for future changes in forfeitures. The Company expects to recognize that cost over a weighted-average period of 2.4 years .

10. Earnings (Loss) Per Share

Basic net earnings (loss) per common share is calculated by dividing net earnings (loss) allocable to common stockholders, computed as the sum of net earnings (loss) and accretion on the Company's redeemable convertible preferred stock, by the weighted-average common shares outstanding during the period, without consideration of common stock equivalents. Diluted net earnings per share is calculated by adjusting the weighted-average shares outstanding for the dilutive effect of common stock equivalents, including stock options and warrants, outstanding for the period as determined using the treasury stock method. For purposes of the diluted net loss per share calculation, common stock equivalents are excluded from the calculation because their effect would be anti-dilutive. Therefore, basic and diluted net loss per share applicable to common stockholders is the same for periods with a net loss.

	For the Year Ended December 31,		
	2016	2015	2014
	(in thousands, except per share amounts)		
Numerator:			
Net (loss) income applicable to common stockholders—basic and diluted	$ (50,720)	$ 24,174	$ (31,754)
Denominator:			
Weighted average shares outstanding - basic	22,233	21,152	15,842
Dilutive stock options	—	1,105	—
Dilutive warrants	—	10	—
Weighted average shares outstanding - diluted	22,233	22,267	15,842
Net (loss) income per share applicable to common stockholders:			
Basic	$ (2.28)	$ 1.14	$ (2.00)
Diluted	$ (2.28)	$ 1.09	$ (2.00)
Anti-dilutive potential common stock equivalents excluded from the calculation of net (loss) income per share:			
Stock options	620	429	1,174
Warrants	71	61	71

11. Income Taxes

The Company records a provision or benefit for income taxes on pre-tax income or loss based on its estimated effective tax rate for the year. During the year ended December 31, 2016, the Company recorded a net loss of $50.7 million and, since it maintains a full valuation allowance on its deferred tax assets, the Company did not record an income tax benefit for the year ended December 31, 2016.

During the year ended December 31, 2015, the Company recorded net income before income taxes of $24.6 million . The Company recorded $0.4 million in income tax expense during the year ended December 31, 2015. The tax expense is the result of alternative minimum tax ("AMT") which, in accordance with the U.S. federal tax code, limits the use of net operating loss carryforwards to ninety percent of AMT income resulting in an effective tax rate of approximately two percent .

The Company's ability to use its operating loss carryforwards and tax credit carryforwards to offset taxable income is subject to restrictions under Sections 382 and 383 of the United States Internal Revenue Code (the "Internal Revenue Code"). Net operating loss and tax credit carryforwards are subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant shareholders over a three-year period in excess of 50 percent, as defined under Sections 382 and 383 of the Internal Revenue Code. Such changes would limit the Company's use of its operating loss and tax credit carryforwards. In such a situation, the Company may be required to pay income taxes, even though significant operating loss and tax credit carryforwards exist. Additionally, any future financing could result in a change in control, as defined by Sections 382 and 383, which could further limit the Company's use its operating loss and tax credit carryforwards.

During the year ended December 31, 2014, the Company did not record a benefit for income taxes related to its operating losses due to the full valuation allowance on its deferred tax assets.

A reconciliation of the federal statutory income tax rate and the Company's effective income tax rate is as follows:

	Year ended December 31,		
	2016	2015	2014
Federal statutory income tax rate	34.0 %	(34.0)%	34.0 %
State income taxes	4.5 %	(5.3)%	5.3 %
Change in valuation allowance	(40.3)%	32.6 %	(41.0)%
Research and development and other credits	3.1 %	7.8 %	4.5 %
Permanent items	(1.0)%	(0.3)%	(0.7)%
Alternative minimum tax	— %	(1.7)%	— %
Other	(0.3)%	(0.8)%	— %
Expiring state net operating loss carryforward	— %	— %	(2.1)%
Effective income tax rate	— %	(1.7)%	— %

The significant components of the Company's net deferred tax assets consist of the following (in thousands):

	December 31,	
	2016	2015
Net operating loss carryforwards	$ 53,809	$ 35,511
Deferred revenue	3,948	3,995
Research and development and other credit carryforwards	10,791	9,666
Other	3,851	2,769
	72,399	51,941
Valuation allowance	(72,399)	(51,941)
Net deferred tax assets	$ —	$ —

Subject to the limitations described above, at December 31, 2016, the Company had gross federal net operating loss carryforwards of $152.2 million and state net operating loss carryforwards of $99.3 million available to reduce future taxable income, which expire at various dates beginning in 2028. Included in the federal and state net operating loss carryforwards are approximately $8.1 million of deductions related to the exercise of stock options which represent an excess tax benefit which will be realized when it results in the reduction of cash income tax. The Company also had federal and state tax credit carryforwards of $8.3 million and $3.8 million , respectively, available to reduce future tax liabilities, which expire at various dates through 2036.

The deferred tax assets above exclude $3.2 million of net operating losses related to tax deductions from the exercise of certain stock options. This amount represents an excess tax benefit and has not been included in the gross deferred tax assets. The Company will adopt ASU 2016-09, Improvements to Employee Share-Based Payment Accounting, for the quarter ended March 31, 2017. As a result of adoption, the deferred tax assets associated with net operating losses will increase by $3.2 million . These amounts will be offset by a corresponding increase in the valuation allowance. The adoption of ASU 2016-09 will have no impact on the Company's operations, financial position or cash flows.

Realization of the future tax benefits is dependent on many factors, including the Company's ability to generate taxable income within the carryforward period. The Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets and concluded that it is more likely than not that the Company will not realize the benefit of its deferred tax assets. As a result, the deferred tax assets have been fully reserved at December 31, 2016 and 2015.

At December 31, 2016, the Company had no unrecognized tax benefits. The Company has not conducted a study of its research and development credit carryforwards. A 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 will be presented as an uncertain tax position. A full valuation allowance has been provided against the Company's research and development credit carryforwards and, if an adjustment is required, this adjustment would be offset by an adjustment to the valuation allowance. Thus, there would be no impact to the consolidated balance sheet or statement of operations if an adjustment were required.

Interest and penalty charges, if any, related to unrecognized tax benefits would be classified as income tax expense in the accompanying statement of operations. As of December 31, 2016, the Company had no accrued interest related to uncertain tax positions.

The Company is currently open to examination under the statute of limitations by the Internal Revenue Service and state jurisdictions for the tax years ended 2012 through 2014 . Carryforward tax attributes generated in years prior to 2011 may still be adjusted upon future examination if they have or will be used in a future period. The Company is currently not under examination by the Internal Revenue Service or any other jurisdictions for any tax years. Since the Company is in a loss carryforward position, the Company is generally subject to examination by the U.S. federal, state and local income tax authorities for all tax years in which a loss carryforward is available.

12. Commitments

The Company leases approximately 50,000 square feet of office and laboratory space in Lexington, Massachusetts under a non-cancelable operating lease agreement, or the 2008 Lease Agreement, as amended. The term continues through September 30, 2018.

The 2008 Lease Agreement, and the subsequent amendment in August 2014, provided for tenant improvement allowances. Certain tenant improvement allowances were required to be repaid to the landlord monthly over the lease term, plus interest at a 10% annual rate. As such, the Company classified the portion of the allowance subject to repayment as a "leasehold improvement loan" on the Company's consolidated balance sheet. Other tenant improvement allowances not subject to repayment were classified in the accompanying balance sheet under the caption "deferred lease incentive." As of December 31, 2016, the Company's repayment obligations for its tenant improvement allowances were fulfilled.

The Company is amortizing all leasehold improvement assets and deferred incentives over the remaining lease term, as amended, and is recognizing rental expense on a straight-line basis over the respective lease term including any free rent periods.

The future minimum lease payments under the 2008 Lease Agreement, as amended, is as follows (in thousands):

		Base rent obligations
At December 31, 2016		
	2017	1,573
	2018	1,208
Total minimum lease payments	$	2,781

13. Collaboration Agreements

Celgene

In April 2013, the Company entered into a master development and license agreement with Celgene Corporation and Celgene International Sàrl, referred to together as Celgene, which is primarily focused on the research, development and commercialization of specified deuterated compounds targeting inflammation or cancer.

The initial program in the collaboration is CTP-730, a deuterium-modified analog of apremilast. Celgene has an exclusive worldwide license to develop, manufacture and commercialize deuterated analogs of apremilast and certain close chemical derivatives thereof. The Company further granted Celgene licenses with respect to two additional programs and an option with respect to a third additional program.

The Company was responsible for conducting and funding research and early development activities for the CTP-730 program at its own expense pursuant to mutually agreed upon development plans. This included the completion of single and multiple ascending dose Phase 1 clinical trials in 2015.

Under the terms of the agreement, the Company received a non-refundable upfront payment of $35.0 million . In October 2015, the Company earned and recognized as milestone revenue an $8.0 million development milestone payment upon completion of Phase 1 clinical evaluations for CTP-730. In addition, the Company is eligible to earn an additional $15.0 million development milestone payment, up to $247.5 million in regulatory milestone payments and up to $50.0 million in sales-based milestone payments related to products within the CTP-730 program. The next milestone payment the Company may be entitled to achieve under the CTP-730 program is $15.0 million related to the first actual dosing in a Phase 3 clinical trial or, if earlier, acceptance for filing of a NDA. If Celgene exercises its rights with respect to either of the two additional license programs, the Company will receive a license exercise fee for the applicable program of $30.0 million and will also be eligible to earn up to $23.0 million in development milestone payments and up to $247.5 million in regulatory milestone payments for that program. Additionally, with respect to one of the additional license programs, the Company is eligible to receive up to $100.0 million in milestone payments based on net sales of products, and with respect to the other additional license program, the Company is eligible to receive up to $50.0 million in milestone payments based on net sales of products. If Celgene exercises its option with respect to the option program, in respect of a compound to be identified at a later time, the Company will receive an option exercise fee of $10.0 million and will be eligible to earn up to $23.0 million in development milestone payments and up to $247.5 million in regulatory milestone payments.

In addition, with respect to each program, Celgene is required to pay the Company royalties on worldwide net sales of each licensed product at defined percentages ranging from the mid-single digits to low double digits below 20% . The royalty rate is reduced on a country-by-country basis during any period within the royalty term when there is no patent claim or regulatory exclusivity covering the licensed product in the particular country.

The Company’s arrangement with Celgene contains the following deliverables: (i) an exclusive worldwide license to develop, manufacture and commercialize deuterated analogs of apremilast related to the CTP-730 program, or the License Deliverable, (ii) obligations to perform research and development services associated with the CTP-730 program, or the R&D Services Deliverable, (iii) obligation to supply nonclinical and clinical trial material related to the CTP-730 program, or the Supply Deliverable, (iv) participation on the JSC during the term of the CTP-730 program, or the JSC Deliverable, (v) significant and incremental discount related to the first additional license program for which the non-deuterated compound has been selected, or the First Discount Deliverable and (vi) significant and incremental discount related to the second additional license program for which the non-deuterated compound has been selected, or the Second Discount Deliverable.

Allocable arrangement consideration at inception was limited to the $35.0 million non-refundable upfront payment. The Company allocated the arrangement consideration for the collaboration among the separate units of accounting using the relative selling price method. The arrangement consideration allocated to the License Deliverable was recognized upon delivery, amounts allocated to the R&D Services Deliverable and Supply Deliverable are recognized under the proportional performance method over the expected period of performance.

During the years ended December 31, 2016, 2015 and 2014, the Company recognized revenue of $19 thousand , $5.1 million and $1.8 million for the R&D Services Deliverable and $43 thousand , $0.5 million and $1.9 million for the Supply Deliverable, respectively. Additionally, the Company recognized revenue of $16 thousand , $32 thousand and $32 thousand related to the JSC deliverable during the years ended December 31, 2016, 2015 and 2014, respectively. The revenue was classified as license and research and development revenue in the accompanying consolidated statement of operations and comprehensive income (loss).

As of December 31, 2016, there was $7.2 million of deferred revenue related to the Company's collaboration with Celgene, $1.1 million of which relates to the Supply Deliverable and R&D Services Deliverable and was classified as a current liability and $6.1 million of which relates to the First and Second Discount Deliverables and was classified as a noncurrent liability, in the accompanying consolidated balance sheet.

Jazz Pharmaceuticals

In February 2013, the Company entered into a development and license agreement with Jazz Pharmaceuticals, Inc., or Jazz Pharmaceuticals, to research, develop and commercialize products containing a deuterated sodium oxybate analog, or D-SXB. Jazz Pharmaceuticals is initially focusing on one analog, designated as JZP-386. Under the terms of the agreement, the Company granted Jazz Pharmaceuticals an exclusive, worldwide, royalty-bearing license under intellectual property controlled by the Company to develop, manufacture and commercialize D-SXB products including, but not limited to, JZP-386.

The Company, together with Jazz Pharmaceuticals, has conducted certain development activities for Phase 1 clinical trials with respect to JZP-386 pursuant to an agreed upon development plan. The Company was responsible under the development plan for conducting the Phase 1 clinical trials with respect to JZP-386. The Company's obligations to conduct further development activities are subject to mutual agreement. Jazz Pharmaceuticals has assumed all manufacturing and development responsibilities relating to JZP-386. Pursuant to the agreement, the Company's costs for activities under the development plan were reimbursed by Jazz Pharmaceuticals, except for the costs of a Phase 1 clinical trial that was conducted in the first half of 2015, which was shared between Jazz Pharmaceuticals and the Company.

Under the agreement, the Company received a non-refundable upfront payment of $4.0 million and is eligible to earn an aggregate of up to $8.0 million in development milestone payments, up to $35.0 million in regulatory milestone payments and up to $70.0 million in sales-based milestone payments based on net product sales of licensed products. The next milestone payment that the Company may be entitled to receive is $4.0 million related to initiation of the first Phase 2 clinical trial of JZP-386.

In addition, Jazz Pharmaceuticals is required to pay the Company royalties at defined percentages ranging from the mid-single digits to low double digits below 20% on worldwide net sales of licensed products. The royalty rate is lowered, on a country-by-country basis, under certain circumstances as specified in the agreement.

The Company determined that there were three deliverables under the agreement: (i) an exclusive, royalty-bearing, sub-licensable worldwide license to develop and commercialize D-SXB compounds, or the License Deliverable, (ii) participation on a joint steering committee, or the JSC Deliverable, and (iii) a deliverable to direct external patent activities and bear a portion of the external patent fees, or the Patent Support Deliverable.

The Company allocated arrangement consideration of $3.7 million to the License Deliverable, $0.1 million to the JSC Deliverable and $0.2 million to the Patent Support Deliverable. The Company recognized the arrangement consideration allocated to the License Deliverable upon delivery and will recognize revenue related to the JSC Deliverable and the Patent Support Deliverable over the respective periods of performance.

For the years ended December 31, 2016, 2015 and 2014, the Company recognized revenue of $55 thousand , $0.8 million and $2.6 million , respectively, related to the performance of development support services. Additionally, for the years ended December 31, 2016, 2015 and 2014, the Company recognized revenue of $41 thousand , $57 thousand and $56 thousand , respectively, related to the JSC and Patent Support deliverables.

Avanir

In February 2012, the Company entered into a development and license agreement with Avanir Pharmaceuticals, Inc., or Avanir, under which the Company granted Avanir an exclusive worldwide license to develop, manufacture and commercialize deudextromethorphan containing products. Avanir is currently focused on developing AVP-786, which is a combination of a deudextromethorphan and an ultra low dose of quinidine. Subsequent to the Company's agreement, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. and it is now a wholly owned subsidiary of Otsuka America, Inc.

Since June 2012, Avanir has elected to conduct all research and development activities, including manufacturing activities; however, the Company has received intellectual property cost reimbursements.

Under the agreement, the Company received a non-refundable upfront payment of $2.0 million and has received milestone payments of $6.0 million . The Company is also eligible to earn, with respect to licensed products comprising a combination of deudextromethorphan and quinidine, up to $37.0 million in regulatory and commercial launch milestone payments, of which $21.5 million in development and regulatory milestone payments are associated with the first indication, and up to $125.0 million in sales-based milestone payments. The next milestone payments that the Company may be entitled to receive are $5.0 million upon acceptance for filing of a New Drug Application, or NDA, $3.0 million upon acceptance for filing of a Marketing Authorization Application, or MAA, and $1.5 million upon acceptance for filing of a NDA by the MHLW related to AVP-786. In addition, the Company is eligible for higher development milestones, up to an additional $43.0 million , for licensed products that do not require quinidine. Avanir is currently developing deudextromethorphan in combination with quinidine.

Avanir also is required to pay the Company royalties at defined percentages ranging from the mid-single digits to low double digits below 20% on net sales of licensed products on a country-by-country basis. The royalty rate is reduced, on a country-by-country basis, during any period within the royalty term when there is no patent claim covering the licensed product in the particular country.

During the year ended December 31, 2015, the Company recognized as revenue a $2.0 million milestone payment received from Avanir based on the initiation of dosing in a Phase 3 clinical trial of AVP-786. During the year ended December 31, 2014, the Company recognized as revenue a $2.0 million milestone payment received from Avanir based on the initiation of dosing in a Phase 2 clinical trial of AVP-786.

Additionally, the Company recognized revenue of $0.1 million and $0.2 million for intellectual property cost reimbursements during the years ended December 31, 2015 and 2014, respectively.

GSK

In May 2009, the Company entered into a research and development collaboration and license agreement with Glaxo Group Limited, or GSK, to research, develop and commercialize multiple products containing deuterated compounds, including CTP-499. The agreement with GSK, as subsequently amended, expired in May 2012 after GSK opted out of further development under the agreement and made a $2.8 million payment to the Company. The Company has an obligation to make a payment to GSK of up to $2.8 million if the Company commercializes CTP-499 or if the Company re-licenses or transfers rights to the CTP-499 program prior to a specified date in 2018. The $2.8 million payment was classified as deferred revenue and will not be recognized as revenue until all repayment obligations lapse.

14. Patent Assignment

In September 2011, the Company entered into a patent assignment agreement with Auspex Pharmaceuticals, Inc., or Auspex, pursuant to which the Company assigned to Auspex a U.S. patent application relating to deuterated pirfenidone analogs. Under the terms of the agreement, the Company is eligible to receive certain royalty payments, or the Royalty Payments, equal to a percentage in the low single digits of net sales in the United States invoiced by Auspex or any of its affiliates, with respect to certain pharmaceutical products containing a deuterated pirfenidone analog. The patent assignment agreement further provides that if Auspex sells to another party all of its U.S. rights to certain deuterated pirfenidone products, or if Auspex grants to another party a license to sell certain deuterated pirfenidone products in the United States, the Company will receive an amount, or the Sublicense/Sale Payments, equal to a percentage in the teens of any proceeds Auspex receives therefrom that are attributable to the rights to such deuterated pirfenidone products in the United States. In addition, the patent assignment agreement provides that if Auspex is acquired in a change in control transaction at any time while it, or any of its affiliates, own certain patents or patent applications related to deuterated pirfenidone, the Company will receive within a specified period following the closing of the transaction 1.44% of any proceeds payable as consideration for the change in control transaction, including any amounts paid to stockholders and certain equity holders of Auspex. Any such change in control payment to the Company is credited to Auspex as a deduction against any future Royalty Payments and Sublicense/Sale Payments that may become due under the agreement, such that Auspex will not be required to make further Royalty Payments and Sublicense/Sale Payments to the Company until the aggregate amount of such Royalty Payments and Sublicense/Sale Payments exceeds the amount of such change in control payment. The patent assignment agreement expires upon the earlier to occur of (1) receipt by the Company of the final Sublicense/Sale Payment arising from (a) the sale of Auspex's U.S. rights to certain deuterated pirfenidone products or (b) Auspex's grant of an exclusive license to sell certain deuterated pirfenidone products in the United States in all indications and fields, or (2) the expiration of the last claim owned by Auspex or any of its affiliates in certain patents or patent applications related to deuterated pirfenidone analogs.

Under the agreement, Concert became eligible to receive a one-time payment of $50.2 million , which was received in June 2015, due to Teva Pharmaceutical Industries Ltd.'s acquisition of Auspex in May 2015. Due to the stage of development of any deuterated pirfenidone products and the considerable uncertainty associated with the receipt of any Royalty Payments and Sublicense/Sale Payments under the agreement, the payment of $50.2 million was recorded as other revenue in the consolidated statement of operations and comprehensive income (loss) for the year ended December 31, 2015.

15. Loan Payable and Warrant to Purchase Redeemable Securities

On December 22, 2011, the Company entered into a Loan and Security Agreement, or the Loan and Security Agreement, with Hercules Technology Growth Capital, Inc., or Hercules. The Loan and Security Agreement provides for aggregate advances of up to $20 million in two tranches. Under the first tranche, the Company obtained an advance on December 22, 2011 totaling $7.5 million , or the December 2011 Advance. Under the second tranche, the Company obtained an advance on March 29, 2012 totaling $12.5 million , or the March 2012 Advance. Each advance made under the Loan and Security Agreement had an interest rate of 8.5% .

On October 1, 2015, the Company made its final payment to Hercules, thereby fulfilling all obligations under the Loan and Security Agreement.

In connection with the Loan and Security Agreement, the Company granted Hercules a warrant, the Warrant, to purchase up to 200,000 shares of Series C Preferred Stock at an exercise price of $2.50 per share which vested immediately upon the December 2011 Advance. Upon the draw of the March 2012 Advance, the Warrant became exercisable for an additional 200,000 shares of Series C Preferred Stock at an exercise price of $2.50 per share. Upon completion of the Company's IPO in February 2014 the Warrant became exercisable for an aggregate of 70,796 shares of the Company's common stock at an exercise price of $14.13 per share.

Pursuant to ASC Topic 480, *Distinguishing Liabilities from Equity* , for periods prior to the Company's IPO the Warrant was classified as a liability and was re-measured to the-then current value at each balance sheet date. The Warrant liability was determined based on Level 3 inputs utilizing the Black-Scholes-Merton option pricing model. On February 19, 2014, upon completion of the IPO, the Warrant converted into a warrant to purchase common stock and the Company reclassified the fair value of the Warrant as of February 19, 2014 to additional paid-in capital and will not be subject to remeasurement in future periods.

16. 401(k) Retirement Plan

In January 2008, the Company established the Concert Pharmaceuticals 401(k) Retirement Plan (the 401(k) Plan) in which substantially all of its permanent employees are eligible to contribute a percentage of base wages up to an amount not to exceed an annual statutory maximum. The Company matches 50% of the first 6% of an employee's contributions subject to statutory limits.

The Company made matching contributions under the 401(k) Plan of $0.3 million , $0.2 million and $0.2 million for the years ended December 31, 2016, 2015 and 2014, respectively.

17. Quarterly Financial Information (unaudited)

	Three Months Ended			
	March 31, 2016	June 30, 2016	September 30, 2016	December 31, 2016
	(in thousands, except per share data) (unaudited)			
Revenue	$ 56	$ 71	$ 26	$ 21
Operating expenses	14,030	13,644	11,494	12,173
Loss from operations	(13,974)	(13,573)	(11,468)	(12,152)
Other income, net	94	132	112	109
Net loss	$ (13,880)	$ (13,441)	$ (11,356)	$ (12,043)
Net loss per share - basic and diluted	$ (0.63)	$ (0.60)	$ (0.51)	$ (0.54)

	Three Months Ended			
	March 31, 2015	June 30, 2015	September 30, 2015	December 31, 2015
	(in thousands, except per share data) (unaudited)			
Revenue	$ 1,306	$ 53,409	$ 1,709	$ 10,305
Operating expenses	10,177	11,719	10,403	9,642
(Loss) Income from operations	(8,871)	41,690	(8,694)	663
Other (expense) income, net	(131)	(77)	(21)	44
(Provision) Benefit for income taxes	—	(567)	161	(23)
Net (loss) income	$ (9,002)	$ 41,046	$ (8,554)	$ 684
Net (loss) income per share—basic	$ (0.48)	$ 1.89	$ (0.39)	$ 0.03
Net (loss) income per share - diluted	$ (0.48)	$ 1.80	$ (0.39)	$ 0.03

18. Subsequent Event

On March 3, 2017, the Company, Vertex Pharmaceuticals (Europe) Limited, a U.K. limited company (“Vertex”), and Vertex Pharmaceuticals Incorporated, a Massachusetts corporation, solely as a guarantor, entered into an Asset Purchase Agreement (the “Asset Purchase Agreement”), pursuant to which, subject to the satisfaction or waiver of the conditions therein, the Company will sell and assign to Vertex the assets of the Company related to the synthesis, research and development of compounds as potential therapeutic products for treating cystic fibrosis. Completion of the asset sale is subject to closing conditions including, but not limited to, various regulatory approvals and the approval of the transaction by the Company’s stockholders.

Upon the closing of the transactions contemplated by the Asset Purchase Agreement (the “Closing”), Vertex has agreed to pay the Company $160 million in cash consideration, with $16 million of such consideration to initially be held in escrow. Additionally, upon the achievement of certain milestone events, Vertex has agreed to pay the Company an aggregate of up to $90 million after the Closing. Of this amount, $50 million will become payable to the Company upon receipt of FDA marketing approval for a combination treatment regimen containing CTP-656 for patients with cystic fibrosis, and $40 million will become payable to the Company upon completion of a pricing and reimbursement agreement in the first of the United Kingdom, Germany or France with respect to a combination treatment regimen containing CTP-656 for patients with cystic fibrosis.

Pursuant to the Asset Purchase Agreement, the Company has agreed to indemnify Vertex for certain matters, including breaches of specified representations and warranties, covenants included in the Asset Purchase Agreement and specified tax claims. Representations and warranties, other than certain fundamental representations and warranties, survive for a period of eighteen months following the Closing and the maximum liability of the Company for claims by Vertex related to the breaches of such representations and warranties, with limited exceptions, is limited to the escrow amount, or $16 million . In no event will the aggregate liability of the Company for indemnification exceed the purchase price paid by Vertex, including any milestone payments. Eighteen months after the Closing, any remaining balance in the escrow account not subject to indemnity claims by Vertex will be released to the Company.

The Asset Purchase Agreement contains certain termination rights for both the Company and Vertex, and provides that, upon termination of the Asset Purchase Agreement under specified circumstances, the Company may be required to pay Vertex a termination fee of $6.4 million , including if the Company accepts a superior acquisition proposal or if the Company’s board of directors effects a change of its recommendation of the approval of the Asset Purchase Agreement to Company stockholders.

ITEM 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

ITEM 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, refers to controls and procedures that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. 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 our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2016, the end of the period covered by this Annual Report on Form 10-K. Based upon such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of such date.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act as a process designed by, or under the supervision of, a company's principal executive officer and principal financial officer, or persons performing similar functions, and effected by a company's board of directors, management, and other personnel, 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 and includes those policies and procedures that:

- pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of a company's assets;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that a company's receipts and expenditures are being made only in accordance with authorizations of the company's management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our 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. 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.

Under the supervision of and with the participation of our principal executive officer and principal financial officer, our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2016 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control—Integrated Framework* (2013 framework). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2016.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the three months ended December 31, 2016 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. Other Information

Asset Purchase Agreement

On March 3, 2017, the Company, Vertex Pharmaceuticals (Europe) Limited, a U.K. limited company ("Vertex"), and Vertex Pharmaceuticals Incorporated, a Massachusetts corporation, solely as a guarantor ("Guarantor"), entered into an Asset Purchase Agreement (the "Asset Purchase Agreement"), pursuant to which, subject to the satisfaction or waiver of the conditions therein, the Company will sell and assign to Vertex the assets of the Company related to the synthesis, research and development of compounds as potential therapeutic products for treating cystic fibrosis.

Upon the closing of the transactions contemplated by the Asset Purchase Agreement (the "Closing"), Vertex has agreed to pay the Company $160 million in cash consideration, with $16 million of such consideration to be held in escrow (as described below). Additionally, upon the achievement of certain milestone events, Vertex has agreed to pay the Company an aggregate of up to $90 million after the Closing. Of this amount, $50 million will become payable to the Company upon receipt of FDA marketing approval for a combination treatment regimen containing CTP-656 for patients with cystic fibrosis, and $40 million will become payable to the Company upon completion of a pricing and reimbursement agreement in the United Kingdom, Germany or France with respect to a combination treatment regimen containing CTP-656 for patients with cystic fibrosis.

Pursuant to the Asset Purchase Agreement, the Company has agreed to indemnify Vertex for certain matters, including breaches of specified representations and warranties, covenants included in the Asset Purchase Agreement and specified tax claims. Representations and warranties, other than certain fundamental representations and warranties, survive for a period of eighteen months following the Closing and the maximum liability of the Company for claims by Vertex related to the breaches of such representations and warranties, with limited exceptions, is limited to the escrow amount, or $16 million. In no event will the aggregate liability of the Company for indemnification exceed the purchase price paid by Vertex, including any milestone payments. Upon the eighteen month anniversary of the Closing, any remaining balance in the escrow account not subject to indemnity claims by Vertex will be released to the Company.

The Closing of the Asset Purchase Agreement is subject to customary conditions, including, among other things, (i) the absence of a termination of the Asset Purchase Agreement in accordance with its terms, (ii) approval of the Asset Purchase Agreement by the stockholders of the Company, (iii) that any applicable waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended (the "HSR Act"), and the rules and regulations thereunder, shall have expired or otherwise been terminated, (iv) that no event, development or circumstance that has had or would reasonably be expected to have a material adverse effect on the Company shall have occurred and (v) no governmental authority shall have enacted any law or order which has the effect of enjoining or otherwise preventing or prohibiting the Asset Purchase Agreement or the Closing. The Closing is also subject to other customary conditions for a transaction of this nature.

The Asset Purchase Agreement contains customary covenants of the Company, including, among others, (i) covenants to conduct its business in the ordinary course during the interim period between the execution of the Asset Purchase Agreement and the Closing and not to engage in certain kinds of transactions during such period and (ii) covenants to make commercially reasonable efforts to do all things necessary to cause the Closing, including obtaining governmental approval under the HSR Act.

The Asset Purchase Agreement contains certain termination rights for both the Company and Vertex, and provides that, upon termination of the Asset Purchase Agreement under specified circumstances, the Company may be required to pay Vertex a termination fee of $6.4 million, including if the Company accepts a superior acquisition proposal or if the Company's board of directors effects a change of its recommendation of the approval of the Asset Purchase Agreement to Company stockholders.

The foregoing description of the Asset Purchase Agreement does not purport to be complete and is qualified in its entirety by reference to the Asset Purchase Agreement, a copy of which is filed as Exhibit 10.12 hereto and is hereby incorporated into this report by reference. The Asset Purchase Agreement, which has been included to provide investors with information regarding its terms, is not intended to provide any other factual information about the Company, Vertex or Guarantor and contains representations and warranties of each of Company, Vertex and Guarantor. The assertions embodied in those representations and warranties, or such other provisions of the Asset Purchase Agreement, were made for purposes of the Asset Purchase Agreement and are subject to qualifications and limitations agreed to by the respective parties in connection with negotiating the terms of the Asset Purchase Agreement, including information contained in confidential schedules that the parties exchanged in connection with signing the Asset Purchase Agreement. Accordingly, investors and security holders should not rely on such representations and warranties, or other provisions, as characterizations of the actual state of facts or circumstances, since they were only made as of a specific date and are modified in important part by the underlying schedules. In addition, certain representations and warranties may be subject to a contractual standard of materiality different from what might be viewed as material to stockholders, or may have been used for purposes of allocating risk between the respective parties rather than establishing matters of fact.

Amended and Restated By-laws

Also on March 3, 2017, the board of directors of the Company adopted an amendment to its Amended and Restated By-laws to include a new Section 5.9 to Article V entitled "Exclusive Jurisdiction of Delaware Courts" (the "By-law Amendment"). The By-law Amendment designates the Court of Chancery of the State of Delaware as the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Company to the Company or the Company's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware or the Certificate of Incorporation or By-laws of the Company, or (iv) any action asserting a claim against the Company governed by the internal affairs doctrine.

The foregoing description of the By-law Amendment does not purport to be complete and is qualified in its entirety by reference to the By-law Amendment, a copy of which is filed as Exhibit 3.3 hereto and is hereby incorporated into this report by reference.

Part III

Item 10. Directors, Executive Officers and Corporate Governance

EXECUTIVE OFFICERS AND DIRECTORS

The following table sets forth the name, age and positions of each of our executive officers and directors as of February 28, 2017.

Name	Age	Position(s)
Executive Officers		
Roger D. Tung, Ph. D.	57	President and Chief Executive Officer, Director
James V. Cassella, Ph.D.	62	Senior Vice President and Chief Development Officer
Ryan Daws	43	Chief Financial Officer
Ian Robert Silverman, J.D., Ph. D.	64	Senior Vice President and General Counsel
Nancy Stuart	59	Chief Operating Officer
Non-Employee Directors		
Richard H. Aldrich	62	Director, Chairman of the Board of Directors
Thomas G. Auchincloss, Jr.	55	Director
Ronald W. Barrett, Ph.D.	61	Director
Meghan FitzGerald, Ph.D.	46	Director
Christine van Heek	60	Director
Peter Barton Hutt, LL.M	82	Director
Wilfred E. Jaeger, M.D.	61	Director
Wendell Wierenga, Ph.D.	69	Director

Executive Officers

Roger D. Tung, Ph.D . is our co-founder and has served as our President and Chief Executive Officer and as a member of our Board of Directors since April 2006. Before Concert, Dr. Tung was a founding scientist at Vertex Pharmaceuticals Incorporated, a pharmaceutical company, where he was employed from 1989 to 2005, most recently as its Vice President of Drug Discovery. Prior to Vertex, he held various positions at Merck, Sharp & Dohme Research Laboratories, a global healthcare provider, and The Squibb Institute for Medicinal Chemistry. Dr. Tung received a B.A. in Chemistry from Reed College and a Ph.D. in Medicinal Chemistry at the University of Wisconsin-Madison. We believe that Dr. Tung’s detailed knowledge of our Company and his 32 year career in the global pharmaceutical and biotechnology industries, including his roles at Vertex, provide a critical contribution to our Board of Directors.

James V. Cassella has served as our Senior Vice President and Chief Development Officer since February 2015. Prior to joining Concert, Dr. Cassella served as Executive Vice President, Research and Development and Chief Scientific Officer of Alexza Pharmaceuticals, Inc. from July 2012 to January 2015 and served as its Senior Vice President, Research and Development from June 2004 to July 2012. From April 1989 to April 2004, Dr. Cassella held various management positions at Neurogen Corporation, a publicly traded biotechnology company. Prior to Neurogen, Dr. Cassella was Assistant Professor of Neuroscience at Oberlin College. Dr. Cassella received a Ph.D. in physiological psychology from Dartmouth College, completed a postdoctoral fellowship in the Department of Psychiatry at the Yale University School of Medicine and received a B.A. in psychology from the University of New Haven.

Ryan Daws has served as our Chief Financial Officer since January 2014. Prior to joining Concert, Mr. Daws served as an independent consultant from June 2013 to January 2014, including an engagement with Concert from September 2013 to January 2014. Mr. Daws served as a Director in the Healthcare Investment Banking Group at Stifel, Nicolaus & Company, Inc., a financial services company, from September 2010 to June 2013. From March 1999 to June 2010, he served in positions of increasing responsibility within the Healthcare Investment Banking Group of Cowen and Company, LLC, a financial services firm. Mr. Daws holds a B.S. in Finance and Organizational Management from the University of South Carolina and an International M.B.A. from the University of South Carolina's Moore School of Business.

Ian Robert Silverman, J.D., Ph.D . has served as our Senior Vice President and General Counsel since December 2010 and prior to that was our Vice President and General Counsel from January 2007 to December 2010. Prior to joining Concert, he served in various legal related roles at Millennium Pharmaceuticals, Inc., a pharmaceutical company, Vertex and FMC Corporation, a chemical manufacturing company. Dr. Silverman was a post-doctoral associate in chemistry at Standford University and received his J.D. from Rutgers-Camden Law School, a Ph.D. in organic chemistry from the University of New Mexico and a B.A. from Lehigh University.

Nancy Stuart has served as our Chief Operating Officer since October 2007 and was our Senior Vice President, Corporate Strategy and Operations from July 2006 to October 2007. Prior to joining Concert, Ms. Stuart held various business operations and business development positions at Amgen Inc., a biopharmaceutical company, Kinetix Pharmaceuticals, Inc., a pharmaceutical company subsequently acquired by Amgen, Scion Pharmaceuticals, Inc., a pharmaceutical company, Vertex and Genzyme Corporation, a biotechnology company subsequently acquired by Sanofi S.A. Ms. Stuart holds a B.S. from the University of Michigan, and an M.B.A. from the Simmons College Graduate School of Management.

General Counsel Transition . Pursuant to a planned transition, Lynette Herscha, Vice President, Legal Affairs and Associate General Counsel, will be promoted to Senior Vice President, General Counsel and Corporate Secretary, succeeding Dr. Robert Silverman as of June 1, 2017. Dr. Silverman will remain an employee with the Company in a senior legal advisory role.

Ms. Herscha has served as our Vice President and Associate General Counsel since July 2014. Prior to joining Concert, she held senior legal positions at Momenta Pharmaceuticals, Inc., a pharmaceutical company and Phase Forward, Incorporated, a technology company. Prior to that, she worked in the law offices of Fulbright & Jaworksi. Ms. Herscha earned her Juris Doctor and Bachelor of Arts from Boston University.

Non-Employee Directors

Richard H. Aldrich is our co-founder and has served as a member of our Board of Directors and as Chairman of our Board of Directors since May 2006. Mr. Aldrich is a co-founder and has been a Partner of Longwood Fund, a venture capital firm, since December 2010. Mr. Aldrich founded RA Capital Management LLC, a hedge fund, in 2001 and served as a Managing Member from 2001 to 2008 and as a Co-Founding Member from 2008 until 2011. Mr. Aldrich has co-founded and helped to build several biotechnology companies including Sirtris Pharmaceuticals, Inc., (acquired by GlaxoSmithKline in 2008), Alnara Pharmaceuticals, Inc. (acquired by Eli Lilly in 2010), Verastem, Inc., OvaScience, Inc. and FlexPharma. Mr. Aldrich was also a founding employee of Vertex Pharmaceuticals Incorporated, where he held the position of Senior Vice President and Chief Business Officer and managed all commercial and operating functions from 1989 to 2001. Prior to joining Vertex, Mr. Aldrich held several management positions at Biogen Inc. Mr. Aldrich serves on the board of directors of OvaScience, Inc., a public life sciences company where he serves as the Lead Director, Mitobridge, Inc., a private biopharmaceutical company, Colorescience, Inc., a private skincare company, and KalVista Pharmaceuticals, a private biopharmaceutical company. During the last five years, Mr. Aldrich also served as a member of the board of directors of PTC Therapeutics, Inc., a public biopharmaceutical company and Verastem, Inc., a public biopharmaceutical company. Mr. Aldrich received his undergraduate degree from Boston College, and an M.B.A. from the Amos Tuck School at Dartmouth College. We believe Mr. Aldrich's broad-based experience in business, including his leadership and board experience at life science companies, and his familiarity with our business as a co-founder of our company allow him to be a key contributor to our Board of Directors.

Thomas G. Auchincloss, Jr. has served as a member of our Board of Directors since December 2014. Since October 2013, Mr. Auchincloss has served as Managing Partner at Counterpoint Trading Company, LLC, a private investment firm. From May 2005 to August 2007, Mr. Auchincloss worked as Chief Financial Officer of Metabolix, Inc., a public biomaterials company. Prior to joining Metabolix, Mr. Auchincloss served as a consultant with Metabolix, from April 2002 to May 2005, providing business development, financial and strategic consulting services. From 1994 to 2001, Mr. Auchincloss served in a variety of positions at Vertex Pharmaceuticals Incorporated, most recently as Vice President, Finance and Treasurer. Mr. Auchincloss is trustee and Treasurer of Kieve Wavus Education, Inc., a not-for-profit camp and education organization. Mr. Auchincloss received a B.S. in Business Administration from Babson College and an M.B.A. in Finance from the Wharton School. We believe that Mr. Auchincloss' financial and industry experience, including his experience as the chief financial officer of a publicly traded biomaterials company, make him a key contributor to our Board of Directors.

Ronald W. Barrett, Ph.D. has served as a member of our Board of Directors since December 2007. Dr. Barrett was a founder of XenoPort, Inc., a public biopharmaceutical company, and served as its Chief Executive Officer from 2001 to 2015, its Chief Scientific Officer from 1999 to 2001 and as a member of its board of directors from 1999 to 2015. Prior to XenoPort, Dr. Barrett held various positions at Affymax Research Institute, a drug discovery company now owned by GlaxoSmithKline plc, and Abbott Laboratories, a healthcare company. During the last five years, Dr. Barrett also served as a member of the board of directors of XenoPort, Inc. Dr. Barrett received a B.S. from Bucknell University and a Ph.D. in pharmacology from Rutgers University. We believe that Dr. Barrett's industry and board experience, including his experience as the chief executive officer of a publicly traded biopharmaceutical company, makes him a key contributor to our Board of Directors.

Meghan FitzGerald, Ph.D. has served as a member of our Board of Directors since March 2016. Since May 2015, Ms. FitzGerald has served as Executive Vice President of Strategy and Policy at Cardinal Health. From October 2010 until May 2015, she served as President, Cardinal Health Specialty Solutions. From March 2008 to July 2010, she was Senior Vice President, New Markets International Division and Business Development, with Medco Health Solutions, Inc. Currently, she is also a member of the Board of Directors of SeniorLink, a privately held provider of in-home elder care and GELESIS, a privately held biotechnology company. Ms. FitzGerald obtained a Doctor of Public Health degree at New York Medical College, focusing on health policy. She also earned a master's degree in public health from Columbia University and a bachelor's degree in nursing from Fairfield University. Ms. FitzGerald's broad-based experience in business, including her leadership and board experience in the healthcare industry, allow her to be a key contributor to our board of directors.

Christine van Heek has served as a member of our Board of Directors since April 2016. Ms. van Heek has served as an adviser and consultant to several companies in the bio-pharmaceutical industry. From 1991 to 2003, Ms. van Heek served in various roles at Genzyme, Inc., a biotechnology company, including positions as Corporate Officer and President, Therapeutics Division; General Manager, Renal Division; and Vice President, Global Marketing. In addition, she has held various sales and marketing positions at Genentech, Inc. and Caremark/HHCA. During the last five years, Ms. van Heek also served as a member of the board of directors of Affymax, Inc., a biopharmaceutical company. Ms. van Heek holds an M.B.A. from Lindenwood University in St. Louis and a B.S.N. from the University of Iowa. We believe that Ms. van Heek's industry experience, including her extensive experience in strategic roles of a publicly traded biomaterials company, make her a key contributor to our Board of Directors.

Peter Barton Hutt has served as a member of our Board of Directors since December 2006. Mr. Hutt has practiced law at Covington & Burling LLP, specializing in food and drug law, since 1960 (except for the period from 1971 to 1975) and currently serves as senior counsel. From 1971 to 1975, he was Chief Counsel for the Food and Drug Administration. Mr. Hutt is a member of the board of directors of Flex Pharma, Inc., Seres Health, Inc., Q Therapeutics, Inc. and Xoma Ltd., each of which is a public biotechnology company, as well as numerous private companies. During the last five years, Mr. Hutt also served as a member of the board of directors of BIND Therapeutics, Inc., Celera Genomics, a public biotechnology company that was acquired by Quest Diagnostics, Inc. in 2011, CV Therapeutics, Inc., a public biotechnology company that was acquired by Gilead Sciences, Inc. in 2009, Ista Pharmaceuticals, Inc., a public pharmaceuticals company that was acquired by Bausch & Lomb Inc. in 2012, DBV Technologies SA, a public biotechnology company, and Momenta Pharmaceuticals, Inc., a public biotechnology company. Mr. Hutt received a B.A. from Yale University, an LL.B. from Harvard Law School and an LL.M. from New York University School of Law. We believe Mr. Hutt's extensive knowledge of regulatory and legal issues related to drug development and his service on numerous boards of directors allow him to be a key contributor to our Board of Directors.

Wilfred E. Jaeger, M.D. has served as a member of our Board of Directors since May 2006. Dr. Jaeger co-founded Three Arch Partners, a venture capital firm, in 1993 and has served as a Partner since that time. Prior to co-founding Three Arch Partners, Dr. Jaeger was a general partner at Schroder Ventures. He is also a member of the board of directors of Threshold Pharmaceuticals, Inc., a public pharmaceutical company, and Nevro Corporation, a public medical device company, as well as numerous private companies. Dr. Jaeger received a B.S. in Biology from the University of British Columbia, his M.D. from the University of British Columbia School of Medicine and an M.B.A. from Stanford University. We believe that Dr. Jaeger's financial and medical knowledge and experience allow him to be a key contributor to our Board of Directors.

Wendell Wierenga, Ph.D. has served as a member of our Board of Directors since March 2014. From June 2011 to February 2014, Dr. Wierenga served as Executive Vice President, Research and Development of Santarus, Inc., a public biopharmaceutical company that was acquired by Salix Pharmaceuticals, Ltd. in January 2014. From 2007 to May 2011, Dr. Wierenga served as Executive Vice President, Research and Development of Ambit Biosciences Corporation, a biopharmaceutical company engaged in the discovery and development of small-molecule kinase inhibitors. From 2003 to 2007, he served as Executive Vice President, Research and Development of Neurocrine Biosciences, Inc., a biopharmaceutical company developing therapeutics for neuropsychiatric, neuroinflammatory and neurodegenerative diseases. From 2000 to 2003, Dr. Wierenga served as the Chief Executive Officer of Syrrx, Inc., a biotechnology company focused on small-molecule drug compounds. Prior to joining Syrrx, from 1990 to 2000, he was senior vice president of worldwide pharmaceutical sciences, technologies and development at Parke-Davis, a division of Warner Lambert Co., a pharmaceutical company that was acquired by Pfizer Inc. in 2000. Prior to Parke-Davis, Dr. Wierenga worked at Upjohn Co., later Pharmacia & Upjohn, Inc., a pharmaceutical and biotechnology company, for 16 years in various positions, most recently as executive director of discovery research. Pfizer acquired Pharmacia & Upjohn, then named Pharmacia Corp., in 2002. Dr. Wierenga received a B.S. from Hope College and a Ph.D. in chemistry from Stanford University. Dr. Wierenga is a member of the boards of directors of Apricus Biosciences, Inc., Cytokinetics, Incorporated and Ocera Therapeutics, Inc. which are publicly traded biopharmaceutical companies. During the last five years, Dr. Wierenga also served as a member of the boards of directors of Anacor Pharmaceuticals, Inc., acquired by Pfizer in 2016, Xenoport, Inc., acquired by Arbor Pharmaceuticals in 2016, and Onyx Pharmaceuticals, Inc., a public biopharmaceutical company that was acquired by Amgen in 2013. We believe that Dr. Wierenga's extensive experience in biopharmaceutical research and development and his service on the boards of directors of several public biopharmaceutical companies allow him to be a key contributor to our Board of Directors.

Audit Committee

The members of our audit committee are Mr. Auchincloss, Dr. Jaeger and Ms. van Heek. Mr. Auchincloss is the chair of the audit committee. Our Board of Directors has determined that each of Mr. Auchincloss and Dr. Jaeger qualifies as an audit committee financial expert within the meaning of SEC regulations and the NASDAQ Listing Rules. In making this determination, our board has considered the formal education and nature and scope of each such director's previous experience, coupled with past and present service on various audit committees. Our audit committee assists our Board of Directors in its oversight of our accounting and financial reporting process and the audits of our financial statements. The audit committee met ten times during fiscal year 2016, including telephonic meetings. The audit committee's responsibilities include:

- appointing, approving the compensation of, and assessing the independence of our independent registered public accounting firm;
- overseeing the work of our independent registered public accounting firm, including through the receipt and consideration of reports from such firm;
- reviewing and discussing with management and the independent registered public accounting firm our annual and quarterly financial statements and related disclosures;
- monitoring our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;
- overseeing our internal audit function, if any;
- discussing our risk management policies;
- establishing policies regarding hiring employees from the independent registered public accounting firm and procedures for the receipt, retention and treatment of accounting related complaints and concerns;
- meeting independently with our internal auditing staff, independent registered public accounting firm and management;
- reviewing and approving or ratifying any related person transactions; and
- preparing the audit committee report required by SEC rules.

We believe that the composition of our audit committee meets the requirements for independence under current NASDAQ listing standards and SEC rules and regulations. Our Board of Directors has determined that Mr. Auchincloss, Dr. Jaeger and Ms. van Heek are independent as independence is currently defined in applicable NASDAQ listing standards.

Code of Business Conduct and Ethics

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. We have posted in the "Corporate Governance" page of the "Investors" section on our website, www.concertpharma.com, a current copy of the code and all disclosures that are required by law or NASDAQ stock market listing standards concerning any amendments to, or waivers from, any provision of the code. Information contained on the website is not incorporated by reference in, or considered part of, this Annual Report on Form 10-K.

Section 16(A) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires our directors, executive officers, and persons holding more than 10% of Concert common stock to report their initial ownership of the common stock and other equity securities and any changes in that ownership in reports that must be filed with the SEC. The SEC has designated specific deadlines for these reports, and we must identify in this proxy statement those persons who did not file these reports when due. Based solely on a review of reports furnished to us, or written representations from reporting persons, we believe all directors, executive officers, and 10% owners timely filed all reports regarding transactions in Concert's securities required to be filed for 2016 by Section 16(a) under the Exchange Act.

Item 11. Executive Compensation

2016 Summary Compensation Table

The following table sets forth information regarding total compensation awarded to, earned by and paid to each individual who served as our chief executive officer during the year ended December 31, 2016 and our two most highly-compensated executive officers (other than our chief executive officer) who were serving as executive officers as of December 31, 2016 for services rendered in all capacities to the Company for the years indicated below. We refer to these individuals as our "named executive officers".

Name	Year	Salary ($)	Bonus ($)	Option awards ($)(2)	Non-equity incentive plan compensation ($) (3)	All other compensation ($) (6)	Total ($)
Roger D. Tung, Ph.D.	2016	499,905	—	1,937,609	199,962	9,756	2,647,232
President and Chief Executive Officer	2015	435,537	—	—	262,211	13,256	711,004
James V. Cassella, Ph.D.	2016	392,700	—	569,885	125,664	10,722	1,098,971
Senior Vice President and Chief Development Officer	2015	353,684 (4)	40,000 (5)	1,308,314	129,991	7,364	1,839,353
Nancy Stuart (1)	2016	384,780	—	911,816	123,130	9,756	1,429,482
Chief Operating Officer							

(1) Ms. Stuart was not a named executive officer for the fiscal year ended December 31, 2015, but is a named executive officer for the fiscal year ended December 31, 2016.

(2) The amounts included in the "Option awards" column reflect the aggregate grant date fair value of option awards in the years indicated, calculated in accordance with FASB ASC Topic 718. Such aggregate grant date fair values do not take into account any estimated forfeitures related to service-vesting conditions. The amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the named executive officer upon exercise of the options. Assumptions used in the calculation of these amounts are included in Note 9 to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

(3) Consists of cash bonuses earned under our 2016 and 2015 executive bonus programs with respect to the years indicated. See the "—Narrative to Summary Compensation Table" described below for a description of the 2016 executive bonus program.

(4) Amount shown represents a sign-on bonus paid in connection with Dr. Cassella's commencement of employment with us in February 2015.

(5) Mr. Cassella joined Concert as our Senior Vice President and Chief Development Officer in February 2015. His annualized base salary for 2015 was $385,000.

(6) Amounts disclosed under the column "All Other Compensation" for 2016 represent Company matching contributions to 401(k) accounts and life insurance premiums.

Narrative to Summary Compensation Table

We review compensation annually for all employees, including our executives. In setting executive base salaries and target incentive bonus levels, determining actual incentive bonus amounts and granting equity incentive awards, we consider compensation for comparable positions in the market, the historical compensation levels of our executives, individual performance as compared to our expectations and objectives, our desire to motivate our employees to achieve short- and long-term results that are in the best interests of our stockholders, and a long-term commitment to our Company. We do not target a specific competitive position or a specific mix of compensation among base salary, bonus or long-term incentives.

Our compensation committee has primary responsibility for determining the compensation of our executive officers. Our compensation committee typically reviews and discusses proposed compensation with the chief executive officer for all executives (other than for the chief executive officer). The compensation committee, without the applicable members of management present, discusses recommendations for management and ultimately approves the compensation of our executive officers. During 2016, our compensation committee engaged Radford, an AON Hewitt company, during the fiscal year ended December 31, 2016 as its independent compensation consultant, to review our executive compensation peer group and program design and to assist with assessing our executives' compensation relative to those at comparable companies. Our compensation committee considered the relationship that Radford has with us, the members of our Board of Directors and our executive officers. Based on the committee's evaluation, the compensation committee has determined that Radford is independent and that their work has not raised any conflicts of interests.

Radford assisted the committee in conducting a competitive compensation assessment for our executive officers for the fiscal year ended December 31, 2016. In evaluating the total compensation of our executive officers, the compensation committee, with the assistance of Radford, established a peer group of 21 publicly traded companies in the biopharmaceutical industry that was selected based on companies whose market capitalization, number of employees, maturity of product development pipeline and area of therapeutic focus are similar to ours. Radford then supplemented the peer group proxy information with published survey data, which provided a broader market representation of companies and deeper position reporting.

The peer group for our executive compensation benchmarking is approved by the compensation committee and based on these criteria, our peer group for 2016 was comprised of the following companies:

Achillion Pharmaceuticals, Inc.	Geron Corporation	Proteostasis Therapeutic, Inc.
Akebia Therapeutics, Inc.	GlycoMimetics, Inc.	Regulus Therapeutics, Inc.
Ardelyx, Inc.	Ignyta, Inc.	Sangamo Biosciences, Inc.
Arrowhead Research Corporation	Inovio Pharmaceuticals, Inc.	Trevena, Inc.
Cytokinetics, Inc.	Karyopharm Therapeutics, Inc.	Xencor, Inc.
Epyzime, Inc.	Mirati Therapeutics, Inc.	Ziopharm Oncology, Inc.
Genocea Biosciences, Inc.	OncoMed Pharmaceuticals, Inc.	

Base salary. In 2016, the base salaries for Dr. Tung, Ms. Stuart, and Dr. Cassella were $499,905, $384,780 and $392,700, respectively. We use base salaries to recognize the experience, skills, knowledge and responsibilities required of all our employees, including our named executive officers. None of our named executive officers is currently party to an employment agreement or other agreement or arrangement that provides for automatic or scheduled increases in base salary.

Annual bonus. Pursuant to our executive bonus program for 2016, our Board of Directors established annual bonus targets based and approved a specified corporate goals. Our corporate goals are typically focused on the achievement of specific research, clinical, regulatory, financial and strategic goals. We consider these to be difficult to attain, conducive to the creation of stockholder value and designed to contribute to our current and future financial success. The corporate goals for 2016 were a research milestone, advancement of our CTP-656, CTP-543 and CTP-730 programs and achievement of financial discipline goals.

In January 2017, the Compensation Committee conducted a review to determine and approve the attainment of such goals and to assess the individual performance of each of our named executive officers. For 2016, the compensation committee approved bonuses of $199,962 to Dr. Tung, $123,130 to Ms. Stuart and $125,664 to Dr. Cassella.

Equity incentives. Although we do not have a formal policy with respect to the grant of equity incentive awards to our executive officers, or any formal equity ownership guidelines applicable to them, we believe that equity grants provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. In addition, we believe that equity grants with a time-based vesting feature promote executive retention because this feature incentivizes our executive officers to remain in our employment during the vesting period. Accordingly, we typically grant stock option awards at the start of employment to each executive officer and our other employees and our compensation committee and Board of Directors periodically review the equity incentive compensation of our named executive officers and other employees, and from time to time, may grant equity incentive awards to them in the form of stock options.

For stock options, the option exercise price is equal to the fair market value of our common stock on the date of grant. Time vested stock option grants made in connection with commencement of employment with us typically vest 25% on the first anniversary of the date of grant or, if earlier, the initial employment date (the "vesting commencement date"), and 6.25% vest per quarter thereafter, through the fourth anniversary of the vesting commencement date. Other stock option grants generally vest 6.25% per quarter through the fourth anniversary of the vesting commencement date.

In January 2016, we granted each of Dr. Tung, Ms. Stuart and Dr. Cassella an option to purchase 170,000, 80,000 and 50,000 shares of our common stock, respectively.

Outstanding Equity Awards at 2016 Fiscal Year End Table

The following table sets forth information regarding outstanding stock options held by our named executive officers as of December 31, 2016.

	Options Awards			
Name	**Number of securities underlying unexercised options (#) exercisable**	**Number of securities underlying unexercised options (#) unexercisable**	**Option exercise price ($)**	**Option expiration date**
Roger D. Tung, Ph.D.	35,097	— (1)	4.58	12/19/2018
	38,052	— (2)	4.41	12/10/2019
	29,202	— (3)	3.79	12/14/2020
	39,822	— (4)	3.50	12/15/2021
	127,063	76,237 (5)	8.40	6/10/2024
	31,875	138,125 (6)	16.85	1/7/2026
James V. Cassella, Ph.D.	61,250	78,750 (7)	14.46	3/5/2025
	9,375	40,625 (6)	16.85	1/7/2026
Nancy Stuart	2,098	— (8)	1.13	12/11/2017
	53,097	— (1)	4.58	12/19/2018
	34,512	— (2)	4.41	12/10/2019
	21,238	— (3)	3.79	12/14/2020
	22,122	— (4)	3.50	12/15/2021
	62,500	37,500 (5)	8.40	06/10/2024
	15,000	65,000 (6)	16.85	01/07/2026

(1) This stock option fully vested in accordance with its terms on December 19, 2012 and vested as to 6.25% of the underlying shares at the end of each successive quarter.

(2) This stock option fully vested in accordance with its terms on December 10, 2013 and vested as to 6.25% of the underlying shares at the end of each successive quarter.

(3) This stock option fully vested in accordance with its terms on December 14, 2014 and vested as to 6.25% of the underlying shares at the end of each successive quarter.

(4) This stock option fully vested in accordance with its terms on December 15, 2015 and vested as to 6.25% of the underlying shares at the end of each successive quarter.

(5) This option was granted under our 2014 Stock Incentive Plan and vested as to 25% of the shares underlying such option on June 10, 2015 and will vest as to an additional 6.25% of the shares at the end of each successive quarter thereafter, through and including June 10, 2018.

(6) This option was granted under our 2014 Stock Incentive Plan and vests as to 6.25% of the shares underlying such option at the end of each successive quarter thereafter, through and including January 7, 2020.

(7) This option was granted under our 2014 Stock Incentive Plan and vested as to 25% of the shares underlying such option on March 5, 2016 and will vest as to an additional 6.25% of the shares at the end of each successive quarter thereafter, through and including March 5, 2019.

(8) This stock option fully vested in accordance with its terms on December 11, 2011 and vested as to 6.25% of the underlying shares at the end of each successive quarter.

Employment Agreements, Severance and Change in Control Arrangements

Employment agreements

We have entered into employment agreements with each of our named executive officers. The employment agreements confirm the executive officers' titles, compensation arrangements, eligibility for benefits made available to employees generally and also provide for certain benefits upon a termination of employment under specified conditions. Each named executive officer's employment is at will.

Payments and benefits provided upon a qualifying termination not in connection with a change of control

Under the terms of the employment agreements we have entered into with each of the named executive officers, if an executive’s employment is terminated by us without "cause" and other than as a result of death or disability or by such executive officer for "good reason", each as defined in such employment agreement, in each case not within the "change of control period", as defined below, and subject to the executive’s execution of an effective general release of potential claims against us, each named executive officer will be entitled to (1) an amount equal to his then-current monthly base salary for a period of 12 months, or 15 months in the case of Dr. Tung and (2) continued Company paid medical and dental benefits to the extent that the named executive officer was receiving them at the time of termination until the earlier of 12 months following termination (or, in the case of Dr. Tung, 15 months following termination) and the date the named executive officer’s COBRA continuation coverage expires, subject to certain legal restrictions.

Payments and benefits provided upon a qualifying termination in connection with a change of control

Under the terms of the employment agreements we have entered into with each of the named executive officers, if the executive’s employment is terminated by us or our successor other than for cause or by such executive officer for good reason, in each case, within one year following a "change of control", as defined in such employment agreement (the "change of control period"), and subject to the executive’s execution of an effective general release of potential claims against us, in lieu of the severance benefits described above, each named executive officer will be entitled to:

- An amount equal to 12 months (or 15 months in the case of Dr. Tung) of the named executive officer’s base salary, which will be paid as a lump sum if the change in control constitutes a change in control under Section 409A of the Internal Revenue Code.
- An amount equal his or her current target bonus (or 1.5 times his target bonus in the case of Dr. Tung).
- Continue Company paid medical and dental benefits to the executive to the extent that he or she was receiving them at the time of termination for until the earlier of 12 months (or 18 months in the case of Dr. Tung) following termination and the date the named executive officer’s COBRA continuation coverage expires, subject to certain legal restrictions.

In addition, if a change of control occurs and within one year following such change of control we or our successor terminate the executive’s employment other than for cause or the executive’s employment ends on death or disability, or the executive terminates his employment for good reason then all stock options held by the executive will immediately vest in full.

If the payments or benefits payable to each named executive officer in connection with a change of control would be subject to the excise tax imposed under Section 4999 of the Internal Revenue Code, then those payments or benefits will be reduced to the extent necessary to avoid the imposition of such excise tax but only if such reduction would result in a higher net after-tax benefit to the named executive officer.

The following table summarizes the severance payments and benefits our named executive officers would be entitled to receive, assuming a qualifying termination occurred on December 31, 2016.

Name	Cash Severance ($)(1)	Bonus ($)(2)	COBRA Continuation ($)(3)	Value of Accelerated Vesting of Equity Awards ($)(4)	Total ($)
Roger D. Tung					
Qualifying termination not in connection with a change of control	624,881	—	34,214	—	659,095
Qualifying termination in connection with a change of control	749,858	374,929	41,057	144,088	1,309,932
James V. Cassella					
Qualifying termination not in connection with a change of control	392,700	—	27,371	—	420,071
Qualifying termination in connection with a change of control	392,700	157,080	27,371	0	577,151
Nancy Stuart					
Qualifying termination not in connection with a change of control	384,780	—	27,371	—	412,151
Qualifying termination in connection with a change of control	384,780	153,912	27,371	70,875	636,938

(1) For a termination by us without cause or by the executive for good reason, in each case not during the change of control period, this amount represents, in the case of Dr. Tung, 15 months' of base salary, and in the case of Ms. Stuart and Dr. Cassella, 12 months of base salary, each at the rate in effect immediately prior to the executive’s termination of employment.

In the event of a termination by us without cause or by the executive for good reason, in each case within 12 months of a change of control, this amount represents, in the case of Dr. Tung, 18 months' base salary, and in the case of Ms. Stuart and Dr. Cassella, 12 months of base salary, each at the rate in effect immediately prior to the executive’s termination of employment.

(2) In the event of a termination by us without cause or by the executive for good reason, in each case within 12 months of a change of control, amounts represent in the case of Dr. Tung, 150% of his target bonus for 2016, and in the case of Ms. Stuart and Dr. Cassella, 100% of the applicable executive’s target bonus for 2016.

(3) This amount represents the Company-paid health and dental coverage. In the case of Dr. Tung, the amounts represent 15 months payable following a termination by us without cause or by him for good reason, in each case not during the change of control period, and represents 18 months payable following a termination by us without cause or by him for good reason, in each case within 12 months of a change of control. With respect to Ms. Stuart and Dr. Cassella, amounts represent 12 months of Company-paid health and dental coverage.

(4) In the event of a termination by us without cause, termination due to death or disability or a termination by the executive for good reason, in each case within 12 months of a change of control, all unvested stock options held by the executive at such time will immediately vest in full. The values for the accelerated vesting of equity awards included in the table above are based on the intrinsic values of such unvested awards on December 31, 2016 (i.e., the difference between the closing price of the Company’s common stock on the NASDAQ Global Market on that date and the applicable exercise price, multiplied by the number of shares for which vesting would have been accelerated).

Other agreements

We have also entered into employee confidentiality, non-competition and proprietary information agreements with each of our named executive officers. Under the employee confidentiality, non-competition and proprietary information agreements, each named executive officer has agreed (1) not to compete with us during his or her employment and for a period of one year after the termination of his or her employment, (2) not to solicit our employees during his or her employment and for a period of one year after the termination of his or her employment, (3) to protect our confidential and proprietary information and (4) to assign to us related intellectual property developed during the course of his or her employment.

401(k) retirement plan

We maintain a 401(k) retirement plan that is intended to be a tax-qualified defined contribution plan under Section 401(k) of the Internal Revenue Code. In general, all of our employees are eligible to participate, beginning on the first day of the month following commencement of their employment. The 401(k) plan includes a salary deferral arrangement pursuant to which participants may elect to reduce their current compensation by up to the statutorily prescribed limit, equal to $18,000 in 2016, and have the amount of the reduction contributed to the 401(k) plan. Participants over the age of 50 are entitled to an additional catch-up contribution up to the statutorily prescribed limit, equal to $6,000 in 2016. Currently, we match 50% of employee contributions up to 6% of the employee's salary, subject to the statutorily prescribed limit, equal to $7,950 in 2016. The match immediately vests in full.

Director Compensation

During 2016, we did not provide any compensation to Dr. Tung, our Chief Executive Officer, for his service as a member of our Board of Directors. Dr. Tung's compensation as an executive officer is set forth above under "Executive Compensation—2016 Summary Compensation Table."

Non-employee director compensation is set by our Board of Directors at the recommendation of our compensation committee. In March 2016, we retained Radford to assist in assesing our non-employee director compensation program and provide recommendations for changes to the program, if any. The updated peer group companies were used in the analysis, as well as other market data. The Board of Directors, based upon the recommendation of the compensation committee, approved an increase in the base retainer for board members effective as of the date of the 2016 annual meeting of stockholders and reflected in the table below.

Under our director compensation program, we pay our non-employee directors a cash retainer for their service on the Board of Directors and for their service on each committee of which the director is a member. The Chairman of the Board of Directors and the chairs of each committee receive higher retainers for such service. These fees are payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of such payment is prorated for any portion of such quarter that the director is not serving on our Board of Directors. The fees paid to non-employee directors for their service on the Board of Directors and for their service on each committee of the Board of Directors of which the director is a member are as follows:

	Annual Member Fee ($)	Chairman Annual Fee ($)
Board of Directors	35,000	65,000
Audit Committee	7,500	15,000
Compensation Committee	5,000	10,000
Nominating and Corporate Governance Committee	3,000	7,000

We also reimburse our non-employee directors for reasonable travel and out-of-pocket expenses incurred in connection with attending our Board of Director and committee meetings.

In addition, under our director compensation program, each new non-employee director elected to our Board of Directors receives an option to purchase 25,000 shares of our common stock. Each of these options will vest in equal quarterly installments over a three-year period measured from the date of grant, subject to the director's continued service as a director, and will become vested and exercisable in full upon a change in control of our Company. Further, on the date of the first board meeting held after each annual meeting of stockholders, each non-employee director that has served on our Board of Directors for at least six months will receive an option to purchase 10,000 shares of our common stock. Each of these options vest in equal quarterly installments over a one-year period measured from the date of grant, subject to the director's continued service as a director, and will become vested and exercisable in full upon a change in control of our Company. The exercise price of each option will equal the fair market value of a share of our common stock on the date of grant.

This program is intended to provide a total compensation package that enables us to attract and retain qualified and experienced individuals to serve as our directors and to align our directors' interests with those of our stockholders.

In accordance with our director compensation program, in June 2016 we granted options to purchase 10,000 shares of our common stock to each of Mr. Aldrich, Mr. Auchincloss, Dr. Barrett, Mr. Hutt, Dr. Jaeger and Dr. Wierenga. In accordance with our director compensation program, we granted options to purchase 25,000 shares of our common stock to each of Dr. FitzGerald and Ms. van Heek, in March 2016 and June 2016, respectively, in connection with their appointments to our Board of Directors.

The following table sets forth information regarding compensation earned by our non-employee directors during 2016.

Name	Fees earned or paid in cash ($)	Option awards ($) (1)	Total ($)
Richard H. Aldrich	74,802	87,201	162,003
Thomas G. Auchincloss, Jr.	47,802	87,201	135,003
Ronald W. Barrett, Ph.D.	42,802	87,201	130,003
Meghan FitzGerald, Ph.D.	29,876	231,335	261,211
Christine van Heek	30,103	218,003	248,106
Peter Barton Hutt	35,802	87,201	123,003
Wilfred E. Jaeger, M.D.	45,302	87,201	132,503
Helmut M. Sch ü hsler, Ph.D. (2)	7,762	0	7,762
Wendell Wierenga, Ph.D.	35,802	87,201	123,003

(1) The amounts included in the “Option awards” column reflect the aggregate grant date fair value of options granted during 2016 calculated in accordance with FASB ASC Topic 718. Such aggregate grant date fair values do not take into account any estimated forfeitures related to service-vesting conditions. The amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the director upon exercise of the options. Assumptions used in the calculation of these amounts are included in Note 9 to the consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. As of December 31, 2016:

- Mr. Aldrich held stock options to purchase 41,236 shares of common stock in the aggregate, of which 36,236 shares were vested, with the remaining shares scheduled to vest through and including June 9, 2017;
- Mr. Auchincloss held stock options to purchase 45,000 shares of common stock in the aggregate, of which 31,667 shares were vested, with the remaining shares scheduled to vest through and including December 11, 2017;
- Dr. Barrett held stock options to purchase 34,156 shares of common stock in the aggregate, of which 29,156 shares were vested, with the remaining shares scheduled to vest through and including June 9, 2017;
- Dr. FitzGerald held stock options to purchase 25,000 shares of common stock in the aggregate, of which 6,250 shares were vested, with the remaining shares scheduled to vest through and including March 22, 2019;
- Ms. van Heek held stock options to purchase 25,000 shares of common stock in the aggregate, of which 4,167 shares were vested, with the remaining shares scheduled to vest through and including June 9, 2019;
- Mr. Hutt held stock options to purchase 34,156 shares of common stock in the aggregate, of which 29,156 shares were vested, with the remaining shares scheduled to vest through and including June 9, 2017;
- Dr. Jaeger held a stock option to purchase 20,000 shares of common stock, of which 15,000 shares were vested, with the remaining shares scheduled to vest through and including June 9, 2017;
- Dr. Wierenga held a stock option to purchase 48,538 shares of common stock, of which 41,455 shares were vested, with the remaining shares scheduled to vest through and including June 9, 2017.

(2) Dr. Schühsler provided notice of his resignation from our Board of Directors effective as of the close of business on April 8, 2016. Dr. Schühsler held vested stock options to purchase 7,500 shares of common stock as of his resignation date, which were exercisable through July 7, 2016.

Compensation Committee Interlocks and Insider Participation

During 2016, the members of our compensation committee were Dr. Barrett, Mr. Aldrich and Dr. FitzGerald. None of our executive officers serves, or in the past has served, as a member of the board of directors or compensation committee, or other committee serving an equivalent function, of any entity that has one or more executive officers who serve as members of our board of directors or our compensation committee. None of the members of our compensation committee is an officer or employee of our company, nor have they ever been an officer or employee of our Company.

Compensation Committee Report

The information contained in this report shall not be deemed to be (1) "soliciting material," (2) "filed" with the SEC, (3) subject to Regulations 14A or 14C of the Exchange Act, or (4) subject to the liabilities of Section 18 of the Exchange Act. This report shall not be deemed incorporated by reference into any of our other filings under the Exchange Act or the Securities Act, except to the extent that we specifically incorporate it by reference into such filing.

The compensation committee reviewed and discussed the disclosure included in the Executive Compensation section of this Annual Report on Form 10-K with management. Based on the review and discussions, the compensation committee recommended to the Board of Directors that the disclosure included in the Executive Compensation section be included in this Annual Report on Form 10-K for the year ended December 31, 2016, for filing with the SEC.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The following table sets forth information, to the extent known by us or ascertainable from public filings, with respect to the beneficial ownership of our common stock as of January 31, 2017 by:

- each of our directors and our director nominees;
- each of our named executive officers;
- all of our directors, our director nominees and executive officers as a group; and
- each person, or group of affiliated persons, who is known by us to beneficially own more than 5% of our common stock.

Beneficial ownership is determined in accordance with the rules and regulations of the SEC. These rules generally attribute beneficial ownership of securities to persons who possess sole or shared voting power or investment power with respect to those securities and include shares of common stock issuable upon the exercise of stock options that are immediately exercisable or exercisable within 60 days after January 31, 2017. Except as otherwise indicated, all of the shares reflected in the table are shares of common stock and all persons listed below have sole voting and investment power with respect to the shares beneficially owned by them, subject to community property laws, where applicable. The information is not necessarily indicative of beneficial ownership for any other purpose.

The percentage ownership calculations for beneficial ownership are based on 22,322,982 shares of common stock outstanding as of January 31, 2017. Except as otherwise indicated in the table below, addresses of named beneficial owners are in care of Concert Pharmaceuticals, Inc., 99 Hayden Avenue, Suite 500, Lexington, Massachusetts 02421.

In computing the number of shares of common stock beneficially owned by a person and the percentage ownership of that person, we deemed outstanding shares of common stock subject to options held by that person that are currently exercisable or exercisable within 60 days after January 31, 2017. We did not deem these shares outstanding, however, for the purpose of computing the percentage ownership of any other person.

Name of beneficial owner	Number of shares beneficially owned	Percentage of shares beneficially owned
5% Stockholders		
Entities affiliated with BVF, Inc. [(1)]	2,616,249	11.7%
Entities affiliated with TVM Capital [(2)]	1,483,672	6.6%
Entities affiliated with GlaxoSmithKline [(3)]	1,356,533	6.1%
Entities affiliated with BlackRock Inc. [(4)]	1,127,145	5.0%
Executive Officers and Directors		
Roger D. Tung, Ph.D. [(5)]	1,010,943	4.5%
James V. Cassella, Ph.D. [(6)]	82,500	*
Nancy Stuart [(7)]	260,768	1.2%
Richard H. Aldrich [(8)]	470,062	2.1%
Thomas G. Auchincloss [(9)]	38,250	*
Ronald W. Barrett, Ph.D. [(10)]	31,656	*
Meghan FitzGerald, Ph.D. [(11)]	8,333	*
Christine van Heek [(12)]	6,250	*
Peter Barton Hutt, LL.M [(13)]	36,080	*
Wilfred E. Jaeger, M.D. [(14)]	17,500	*
Wendell Wierenga, Ph.D. [(15)]	58,427	*
All current executive officers and directors as a group (13 persons) [(16)]	2,020,769	10.1%

* Represents beneficial ownership of less than 1% of our outstanding stock.

(1) Based on information set forth in a Schedule 13G filed with the Securities and Exchange Commission on February 14, 2017 by the following entities and individual. Consists of (i) 1,193,342 shares of common stock beneficially owned by Biotechnology Value Fund, L.P. ("BVF"), (ii) 758,494 shares of common stock beneficially owned by Biotechnology Value Fund II, L.P ("BVF2") and (iii) 238,511 shares of common stock beneficially owned by Biotechnology Value Trading Fund OS LP ("Trading Fund OS"). BVF Partners OS Ltd. ("Partners OS") as the general partner of Trading Fund OS may be deemed to beneficially own the 238,511 shares of Common Stock beneficially owned by Trading Fund OS. BVF Partners L.P. ("Partners"), as the general partner of BVF, BVF2, the investment manager of Trading Fund OS, and the sole member of Partners OS, may be deemed to beneficially own the 2,232,014 shares of Common Stock beneficially owned in the aggregate by BVF, BVF2, Trading Fund OS, and certain Partners management accounts (the "Partners Management Accounts"), including 425,902 shares of Common Stock held in the Partners Management Accounts. BVF Inc., as the general partner of Partners, may be deemed to beneficially own the 2,616,249 shares of Common Stock beneficially owned by Partners. Mr. Lampert, as a director and officer of BVF Inc., may be deemed to beneficially own the 2,616,249 shares of Common Stock beneficially owned by BVF Inc. Partners OS disclaims beneficial ownership of the shares of Common Stock beneficially owned by Trading Fund OS. Each of Partners, BVF Inc. and Mr. Lampert disclaims beneficial ownership of the shares of Common Stock beneficially owned by BVF, BVF2, Trading Fund OS, and the Partners Management Accounts. The address for Trading Fund OS and Partners OS is PO Box 309 Ugland House, Grand Cayman, KY1-1104 Cayman Islands and the address for each of the other entities and for Mr. Lampert is 1 Sansome Street, 30th Floor, San Francisco, California 94104.

(2) Based on information set forth in a Schedule 13G filed with the Securities and Exchange Commission on February 16, 2016. Consists of 1,104,969 shares of common stock held by TVM Life Science Ventures VI GMBH & Co. KG and 378,703 shares of common stock held by TVM Life Science Ventures VI LP. Alexandra Goll, Helmut Schühsler, Hubert Birner, Stefan Fischer and Axel Polack are members of the investment committee of TVM Life Science Ventures VI Management Limited Partnership, a special limited partner of TVM Life Science Ventures VI GMBH & Co. KG and TVM Life Science Ventures VI LP with voting and dispositive power over the shares held by those entities. TVM Life Science Venture VI Management Limited Partnership and these individuals each disclaim beneficial ownership of such shares except to the extent of any pecuniary interest therein. The address for each of the individuals and entities listed above is c/o TVM Capital GmbH, Maximilianstrasse 35, Entrance C, 80539 Munich, Germany.

(3) Based on information set forth in a Schedule 13G filed with the Securities and Exchange Commission on February 13, 2015 by GlaxoSmithKline plc. Consists of 1,179,941 shares of common stock held by Glaxo Group Limited and 176,592 shares of common stock held by S.R. One, Limited, each of which is a wholly owned subsidiary of GlaxoSmithKline plc. The address of these entities is 980 Great West Road, Brentford, Middlesex, United Kingdom TW8 9GS.

(4) Based on information set forth in a Schedule 13G filed with the Securities and Exchange Commission on January 23, 2017 by BlackRock, Inc. Consists of 1,127,145 shares of common stock beneficially owned by BlackRock, Inc. The address for BlackRock, Inc. is 55 East 52nd Street, New York, NY, 10055.

(5) In addition to shares of common stock held directly, includes 121,873 shares of common stock held by the Roger D. Tung 2011 GRAT, for which Dr. Tung is the sole trustee, 12,389 shares of common stock held by the RD Tung Irrevocable Trust, for which Dr. Tung's wife is a co-trustee, and 13,274 shares of common stock held by the Tung Family Investment Trust, for which Dr. Tung is a co-trustee. Includes 324,442 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(6) Consists of 82,500 shares of common stock issuable upon exercise of options exercisable within 60 days after January 31, 2017.

(7) In addition to shares of common stock held directly, includes 221,817 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(8) In addition to shares of common stock held directly, includes 61,946 shares of common stock held by Little Bear Associates, Inc., formerly known as RA Capital Associates, Inc., of which Mr. Aldrich is the sole stockholder, and 82,405 shares of common stock held by the Little Eagles, LLC, of which the owners of Little Eagles, LLC are Richard H. Aldrich Irrevocable Trust of 2011 and trusts established for the benefit of the Mr. Aldrich's minor children. The trustees of Richard H. Aldrich Irrevocable Trust of 2011 are Mr. Aldrich's spouse, Nichole A. Aldrich, and Mr. Aldrich's brother, Caleb F. Aldrich. The beneficiaries of Richard H. Aldrich Irrevocable Trust of 2011 are Mr. Aldrich's minor children. Mr. Aldrich disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Includes 38,736 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(9) In addition to shares of common stock held directly, includes 36,250 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(10) Consists of 31,656 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(11) Consists of 8,333 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(12) Consists of 6,250 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(13) In addition to shares held directly, includes 31,656 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(14) Includes 17,500 shares of common stock issuable upon the exercise of options exercisable within 60 days after March 31, 2016.

(15) In addition to shares held directly, includes 46,038 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

(16) Includes 1,167,120 shares of common stock issuable upon the exercise of options exercisable within 60 days after January 31, 2017.

Item 13. Certain Relationships and Related Transactions, and Director Independence

Policies and Procedures for Related Person Transactions

Our Board of Directors has adopted a written related person transaction policy to set forth policies and procedures for the review and approval or ratification of related person transactions. This policy covers any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we were or are to be a participant, the amount involved exceeds $120,000, and a related person had or will have a direct or indirect material interest, including, without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person.

Our related person transaction policy contains exceptions for any transaction or interest that is not considered a related person transaction under SEC rules as in effect from time to time. In addition, the policy provides that an interest arising solely from a related person's position as an executive officer of another entity that is a participant in a transaction with us will not be subject to the policy if each of the following conditions is met:

- the related person and all other related persons own in the aggregate less than a 10% equity interest in such entity;
- the related person and his or her immediate family members are not involved in the negotiation of the terms of the transaction with us and do not receive any special benefits as a result of the transaction; and
- the amount involved in the transaction equals less than the greater of $200,000 or 5% of the annual gross revenue of the company receiving payment under the transaction.

The policy provides that any related person transaction proposed to be entered into by us must be reported to our General Counsel and will be reviewed and approved by our audit committee in accordance with the terms of the policy, prior to effectiveness or consummation of the transaction whenever practicable. The policy provides that if our chief financial officer determines that advance approval of a related person transaction is not practicable under the circumstances, our audit committee will review and, in its discretion, may ratify the related person transaction at the next meeting of the audit committee. The policy also provides that alternatively, our chief financial officer may present a related person transaction arising in the time period between meetings of the audit committee to the chair of the audit committee, who will review and may approve the related person transaction, subject to ratification by the audit committee at the next meeting of the audit committee.

In addition, the policy provides that any related person transaction previously approved by the audit committee or otherwise already existing that is ongoing in nature will be reviewed by the audit committee annually to ensure that such related person transaction has been conducted in accordance with the previous approval granted by the audit committee, if any, and that all required disclosures regarding the related person transaction are made.

The policy provides that transactions involving compensation of executive officers will be reviewed and approved by our compensation committee in the manner to be specified in the charter of the compensation committee.

A related person transaction reviewed under this policy will be considered approved or ratified if it is authorized by the audit committee in accordance with the standards set forth in the policy after full disclosure of the related person's interests in the transaction. As appropriate for the circumstances, the policy provides that the audit committee will review and consider:

- the related person's interest in the related person transaction;
- the approximate dollar value of the amount involved in the related person transaction;
- the approximate dollar value of the amount of the related person's interest in the transaction without regard to the amount of any profit or loss;
- whether the transaction was undertaken in the ordinary course of business of our company;
- whether the transaction with the related person is proposed to be, or was, entered into on terms no less favorable to us than the terms that could have been reached with an unrelated third party;
- the purpose of, and the potential benefits to us of, the transaction; and
- any other information regarding the related person transaction or the related person in the context of the proposed transaction that would be material to investors in light of the circumstances of the particular transaction.

The policy provides that the audit committee will review all relevant information available to it about the related person transaction. The policy provides that the audit committee may approve or ratify the related person transaction only if the audit committee determines that, under all of the circumstances, the transaction is in, or is not inconsistent with, our best interests. The policy provides that the audit committee may, in its sole discretion, impose such conditions as it deems appropriate on us or the related person in connection with approval of the related person transaction.

No related person transactions were brought to the attention of the audit committee for consideration in 2016.

Item 14. Principal Accountant Fees and Services

The following table summarizes the fees Ernst & Young LLP, our independent registered public accounting firm, billed to us for each of the last two fiscal years.

Fee Category	2016	2015
Audit Fees (1)	$ 423,535	$ 425,750
Audit-Related Fees	—	—
Tax Fees (2)	37,960	77,950
All Other Fees (3)	2,000	2,000
Total Fees	$ 463,495	$ 505,700

(1) Audit fees for 2016 and 2015 consist of fees for the audit of our consolidated financial statements and the review of our interim financial statements. Audit fees for 2015 also include fees associated with the March 2015 public offering.

(2) Tax fees consists of fees incurred for tax compliance and tax return preparation. Tax fees for 2016 and 2015 also include fees incurred in connection with preparation of an ownership analysis pursuant to Section 382 of the Internal Revenue Code to quantify any limitations on the availability of net operating loss carryforwards to offset taxable income.

(3) All Other Fees represents payment for access to the Ernst & Young LLP online accounting research database.

Pre-approval Policy and Procedures

The audit committee of our Board of Directors has adopted policies and procedures for the pre-approval of audit and non-audit services for the purpose of maintaining the independence of our independent auditor. We may not engage our independent auditor to render any audit or non-audit service unless either the service is approved in advance by the audit committee, or the engagement to render the service is entered into pursuant to the audit committee’s pre-approval policies and procedures. Notwithstanding the foregoing, pre-approval is not required with respect to the provision of services, other than audit, review or attest services, by the independent auditor if the aggregate amount of all such services is no more than 5% of the total amount paid by us to the independent auditor during the fiscal year in which the services are provided, such services were not recognized by us at the time of the engagement to be non-audit services and such services are promptly brought to the attention of the audit committee and approved prior to completion of the audit by the audit committee.

From time to time, our audit committee may pre-approve services that are expected to be provided to us by the independent auditor during the following 12 months. At the time such pre-approval is granted, the audit committee must identify the particular pre-approved services in a sufficient level of detail so that our management will not be called upon to make a judgment as to whether a proposed service fits within the pre-approved services and, at each regularly scheduled meeting of the audit committee following such approval, management or the independent auditor shall report to the audit committee regarding each service actually provided to us pursuant to such pre-approval.

During our 2016 and 2015 fiscal years, no services were provided to us by Ernst & Young LLP or any other accounting firm other than in accordance with the pre-approval policies and procedures described above.

Part IV

ITEM 15. Exhibits and Financial Statement Schedules

(1) Financial Statements

Our consolidated financial statements are set forth in Part II, Item 8 of this Annual Report on Form 10-K and are incorporated herein by reference.

(2) Financial Statement Schedules

Schedules have been omitted since they are either not required or not applicable or the information is otherwise included herein.

(3) Exhibits

The exhibits filed as part of this Annual Report on Form 10-K are listed in the Exhibit Index immediately preceding such Exhibits, which Exhibit Index is incorporated herein by reference.

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, on March 6, 2017.

	CONCERT PHARMACEUTICALS, INC.
By:	/s/ Roger D. Tung
	Roger D. Tung, Ph.D.
	President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Roger D. Tung Roger D. Tung, Ph.D.	Director, President and Chief Executive Officer (Principal Executive Officer)	March 6, 2017
/s/ Ryan Daws Ryan Daws	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	March 6, 2017
/s/ Richard H. Aldrich Richard H. Aldrich	Chairman	March 6, 2017
/s/ Thomas G. Auchincloss Thomas G. Auchincloss	Director	March 6, 2017
/s/ Ronald W. Barrett Ronald W. Barrett, Ph.D.	Director	March 6, 2017
/s/ Meghan FitzGerald Meghan FitzGerald, Ph.D.	Director	March 6, 2017
/s/ Christine van Heek Christine van Heek	Director	March 6, 2017
/s/ Peter Barton Hutt Peter Barton Hutt	Director	March 6, 2017
/s/ Wilfred E. Jaeger Wilfred E. Jaeger, M.D.	Director	March 6, 2017
/s/ Wendell Wierenga Wendell Wierenga, Ph.D.	Director	March 6, 2017

Exhibit Index

Exhibit number	Description
3.1	Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's current report on Form 8-K (File No. 001-36310) filed with the SEC on February 20, 2014)
3.2	Amended and Restated Bylaws of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's current report on Form 8-K (File No. 001-36310) filed with the SEC on February 20, 2014)
3.3 *	Amendment to Amended and Restated Bylaws of the Registrant
4.1	Specimen certificate evidencing shares of common stock (incorporated by reference to Exhibit 4.1 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.1	Third Amended and Restated Registration Rights Agreement, dated as of June 1, 2009, as amended (incorporated by reference to Exhibit 10.1 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.2	Warrant to purchase shares of Series C Convertible Preferred Stock issued by the Registrant to Hercules Technology Growth Capital, Inc. (incorporated by reference to Exhibit 10.2 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.3 #	Amended and Restated 2006 Stock Option and Grant Plan, as amended (incorporated by reference to Exhibit 10.3 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.4 #	Form of Incentive Stock Option Agreement under 2006 Stock Option and Grant Plan (incorporated by reference to Exhibit 10.4 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.5 #	Form of Nonstatutory Stock Option Agreement under 2006 Stock Option and Grant Plan (incorporated by reference to Exhibit 10.5 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.6 #	2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.6 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.7 #	Form of Incentive Stock Option Agreement under 2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.7 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.8 #	Form of Nonstatutory Stock Option Agreement under 2014 Stock Incentive Plan (incorporated by reference to Exhibit 10.8 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.9 #	Amended and Restated Employment Agreement, dated as of June 13, 2014, by and between the Registrant and Roger D. Tung, (incorporated by reference to Exhibit 99.1 to the Registrant's current report on Form 8-K (File No. 001-36310) filed with the SEC on June 16, 2014)
10.10 #*	Form of Employment Agreement by and between the Registrant and each of its executive officers (other than Roger D. Tung)

Exhibit number	Description
10.11 #*	Amended and Restated Employment Agreement, dated March 1, 2017, by and between the Registrant and Ian Robert Silverman
10.12 *	Asset Purchase Agreement, dated March 3, 2017, by and between the Registrant and Vertex Pharmaceuticals (Europe) Ltd., as Buyer, and Vertex Pharmaceuticals Inc., as Guarantor
10.13 #	Form of Director and Officer Indemnification Agreement by and between the Registrant and each of Roger D. Tung, Nancy Stuart, D. Ryan Daws, Ian Robert Silverman, Pauline McGowan, Richard H. Aldrich, Thomas Auchincloss, Jr. Ronald W. Barrett, John G. Freund, Peter Barton Hutt, Wilfred E. Jaeger, Helmut M. Schühsler and Wendell Wierenga (incorporated by reference to Exhibit 10.13 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.14	Lease Agreement, dated as of February 12, 2008, by and between the Registrant and One Ledgemont LLC (incorporated by reference to Exhibit 10.15 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.15	Amendment of Lease, dated as of August 6, 2014, by and between the Registrant and 128 Spring Street Lexington, LLC (incorporated by reference to Exhibit 10.4 to the Registrant's quarterly report on Form 10-Q (File No. 001-36310), filed with the SEC on August 12, 2014)
10.16 †	Development and License Agreement, dated as of February 24, 2012, between the Registrant and Avanir Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.16 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.17 †	Development and License Agreement, dated as of February 26, 2013, between the Registrant and Jazz Pharmaceuticals Ireland Limited (incorporated by reference to Exhibit 10.17 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.18 †	Amendment No. 1, dated February 26, 2015, to Development and License Agreement dated February 26, 2013 by and between the Registrant and Jazz Pharmaceuticals Ireland Limited (incorporated by reference to Exhibit 10.1 to the Registrant's quarterly report on Form 10-Q (File No. 001-36310), filed with the SEC on May 11, 2015)
10.19 †	Master Development and License Agreement, dated as of April 4, 2013, among the Registrant, Celgene International Sàrl and Celgene Corporation (incorporated by reference to Exhibit 10.18 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on February 3, 2014)
10.20 †	Patent Assignment Agreement, dated September 8, 2011, by and between the Registrant and Auspex Pharmaceuticals, Inc. (incorporated by reference to Exhibit 10.1 to the Registrant's quarterly report on Form 10-Q (File No. 001-36310), filed with the SEC on May 11, 2015)
10.21 #	Summary of Executive Bonus Program (incorporated by reference to Exhibit 10.19 to the Registrant's registration statement on Form S-1 (File No. 333-193335), filed with the SEC on January 13, 2014)
10.22 #*	Summary of Director Compensation Program
21.1*	Subsidiaries of the Registrant
23.1*	Consent of Ernst & Young LLP
31.1*	Chief Executive Officer—Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Chief Financial Officer—Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

32.1**	Chief Executive Officer—Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2**	Chief Financial Officer—Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
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 Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

* Filed herewith.

** Furnished herewith.

† Confidential treatment requested as to certain portions, which portions have been omitted and filed separately with the Securities and Exchange Commission.

\# Management contracts or compensatory plans or arrangements required to be filed as an exhibit hereto pursuant to Item 15(a) of Form 10-K.

Exhibit 3.3

AMENDMENT TO

AMENDED AND RESTATED BY-LAWS

OF

CONCERT PHARMACEUTICALS, INC.

The Amended and Restated By-laws of Concert Pharmaceuticals, Inc. are hereby amended by inserting the following new Section immediately after the present Article V, Section 5.8.

"5.9 Exclusive Jurisdiction of Delaware Courts . Unless the corporation consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the corporation, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the corporation to the corporation or the corporation's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware or the Certificate of Incorporation or By-laws, or (iv) any action asserting a claim against the corporation governed by the internal affairs doctrine."

Exhibit 10.10

Form of Employment Agreement

[Date]

[Name and Address]

Dear [Name]:

This agreement revises the terms of your continued employment as ______________ of Concert Pharmaceuticals, Inc. (the " ***Company*** "or " ***Concert*** "and, with you, the " ***Parties*** ") reporting to the Company's Chief Executive Officer, effective as of ___________ (the " ***Effective Date*** "). You agree to continue to perform the duties of your position and such other duties as the Board may reasonably assign to you from time to time.

1. **Salary.** You will receive annualized base salary of $___________ per year (as in effect from the Effective Date), payable in accordance with the regular payroll practices of the Company and less applicable taxes and withholdings, as in effect from time to time. The base salary shall be subject to increase from time to time by the Compensation Committee of the Board (the " ***Compensation Committee*** ") in its exclusive discretion.

2. **Bonus.** During your employment, you may be eligible for an annual discretionary performance bonus in addition to your base salary. Bonus compensation in any year, if any, will be based on your performance and/or that of the Company, in accordance with a general bonus program to be established by the Board (and administered by the Compensation Committee) and will be payable not later than two and one-half months following the calendar year, except as the bonus program may from time to time provide.

3. **Benefits; Vacation.** You will be entitled to participate in all employee benefit plans from time to time in effect for employees of the Company generally. Your participation will be subject to the terms of the applicable plan documents and generally applicable Company policies. Benefits are subject to change at any time at the Company's sole discretion. You will remain eligible to accrue three weeks' paid vacation in each calendar year (or such greater amount as is generally made available in accordance with the Company's policies from time to time in effect), in addition to holidays observed by the Company. Vacation may be taken at such times and intervals as you shall determine, subject to the business needs of the Company, and otherwise shall be subject to the policies of the Company, as in effect from time to time.

4. **Expense Reimbursement .** The Company will pay or reimburse you for all and customary reasonable out-of-pocket business expenses incurred or paid by you in the performance of your duties and responsibilities for the Company, subject to any maximum annual limit and other restrictions on such expenses set by the Company and to such reasonable substantiation and documentation as the Company may specify. Any such reimbursement that would constitute nonqualified deferred compensation subject to Section 409A of the Internal

Revenue Code of 1986, as amended (" ***Section 409A*** "of the " ***Code*** ") shall be subject to the following additional rules: (i) no reimbursement of any such expense shall affect your right to reimbursement of any other such expense in any other taxable year; (ii) reimbursement of the expense shall be made, if at all, not later than the end of the calendar year following the calendar year in which the expense was incurred; and (iii) the right to reimbursement shall not be subject to liquidation or exchange for any other benefit.

5. **Confidentiality Agreement.** You represent that you have complied and agree that you will continue to comply with the Employee Confidentiality, Non-Competition, and Proprietary Information Agreement between the Company and you dated June 19, 2006 (the " ***Confidentiality Agreement*** "). It is understood and agreed that a breach by you of the Confidentiality Agreement would be a material breach of this Agreement.

6. **At-Will; Timing for Termination; Accrued Benefits.** This employment letter is not intended to create or constitute an employment agreement or contract (express or implied) between you and the Company for a fixed term. It is also important for you to understand that Massachusetts is an "at will" employment state. This means that you will have the right to terminate your employment relationship with the Company at any time for any reason, although you are requested to give at least two weeks' notice. Similarly, the Company will have the right to terminate its employment relationship with you at any time for any reason. You may terminate your employment hereunder for Good Reason (as defined below) by providing notice to the Company of the condition giving rise to the Good Reason no later than 30 days following the occurrence of the condition, by giving the Company 30 days to remedy the condition and by terminating employment for Good Reason within 30 days

thereafter if the Company fails to remedy the condition. Upon your termination, the Company will pay on the date of termination any base salary earned but not paid through the date of termination and pay for any vacation time accrued but not used to that date. In addition, the Company will pay you any bonus that has been awarded to you and earned, but not yet paid on the termination of your employment (together with the preceding sentence, the " ***Accrued Benefits*** "). In the event of any termination of your employment, other than a termination under Section 7 or as provided for COBRA under Section 7(c), the Company shall have no obligation to you under this Agreement other than with respect to the Accrued Benefits.

7. **Termination without Cause; Termination for Good Reason.**

(a) **Severance Pay.** A termination by you for Good Reason, or any termination of your employment by the Company (other than for Cause, as defined below, death, or inability to perform as a result of physical or mental infirmity (" ***disability*** ") shall entitle you to 12 months of severance pay (the " ***Severance Pay*** ") and the other compensation provided in this section, as well as to the Accrued Benefits. The Severance Pay shall be calculated on the basis of your base salary as of the date the Company gives you notice of your termination and shall be exclusive of any bonus or benefit payments. The Company will provide the Severance Pay in the form of salary continuation in accordance with the normal payroll practices of the Company, beginning with the Company's next regular payroll period following the Effective Release Date (as defined below), with the first payment including any amounts that would have been paid between the termination date and the Effective Release Date if the payments had commenced on the termination date and with the remaining payments made proportionately over the remainder of the 12 month severance period. The receipt of any severance benefits provided for under this Section 7 or otherwise shall be dependent upon your delivery to the Company, within 60 days following the date of termination of employment, of an effective general release of claims in a form provided by the Company; provided, however, that if the last day of the 60 day period falls in the calendar year following the year of your date of termination, the severance payments shall be paid or commence on the first payroll period of such subsequent calendar year following the Effective Release Date. The date on which your release of claims becomes effective is the " ***Effective Release Date.*** "

(b) **COBRA.** In addition to Severance Pay, if you are participating in the Company's group health plan and/or dental plan at the time your employment ends and you exercise the right to continue participation in those plans under the federal law known as COBRA, or any successor law and if your employment has ended for a reason other than resignation without Good Reason or termination for Cause, the Company will continue to pay the full premium for such coverage that is applicable for active and similarly-situated employees who receive the same type of coverage (single, family, or other) until the earlier of (i) the end of the 12th month after your employment ends or (ii) the date your COBRA continuation coverage expires, unless the Company's providing payments for COBRA will violate the nondiscrimination requirements of applicable law, in which case this benefit will not apply.

(c) **Effect of Change of Control.** If a Change of Control (as defined below) occurs and if, within one year following such Change of Control, the Company or any successor thereto terminates your employment other than for Cause, or you terminate your employment for Good Reason, then, in addition to the Severance Pay, you will receive an amount equal to your then current target bonus (payable ratably in accordance with the Severance Pay). If the Change of Control is a 409A Change of Control Event (as defined below), in lieu of installments, the Severance Pay will be paid in a single lump sum in the Company's next regular payroll period following the Effective Release Date (subject to the same delay provided above where the 60 day period ends in the following year). A " ***409A Change of Control Event*** "is a "change in the ownership or effective control" of the Company or "change in the ownership of a substantial portion of the assets" of the Company within the meaning of Treasury Regulation § 1.409A-3(i)(5). In addition, if a Change of Control occurs and if, within one year following such Change of Control, (a) the Company or any successor thereto terminates your employment other than for Cause or your employment ends on death or disability, or (b) you terminate your employment for Good Reason, then all stock options held by you at such time shall immediately vest in full, notwithstanding any contrary provision in any agreement evidencing any such stock option.

(d) **Definitions.**

i. For purposes of this Agreement, " ***Cause*** "shall include (i) your conviction or plea of guilty or *nolo contendre* to a crime involving moral turpitude which adversely affects your ability to perform your obligations to the Company or the business activities, reputation, goodwill or image of the Company or to a felony, (ii) your deliberate dishonesty or breach of fiduciary duty which could be reasonably expected to or does cause material loss, damage or injury to the Company, (iii) your material breach of the terms of this agreement or your failure or refusal to carry out any material tasks assigned to you by the Company in accordance with the terms hereof, which breach or failure (only as to those susceptible to cure) continues for a period of more than ten days after your receipt of written notice thereof and which could be reasonably expected to or does cause material loss, damage or injury to the Company, (iv) the commission by you of any act of fraud, embezzlement or deliberate disregard of a rule or policy of the Company known to you or contained in a policy and procedure manual provided to you which could be reasonably expected to or does cause material loss, damage or injury to the Company, or (v) the material breach or threatened breach by you of any of the provisions of the Confidentiality Agreement which could be reasonably expected to or does cause material loss, damage or injury to the Company. (" ***Company*** " for purposes of this section, shall include the Company and any Company subsidiary.)

ii. " ***Good Reason*** "shall mean, without your consent: (i) material diminution in the nature or scope of your responsibilities, duties or authority, provided that neither of the following (x) or (y) shall constitute Good Reason: (x) the Company's failure to continue your appointment or election as a director or officer of any of its Affiliates nor (y) any diminution in the nature or scope of your responsibilities, duties or authority that is reasonably related to a diminution of the business of the Company or any of its Affiliates, other than any such diminution resulting from the sale or transfer of any or all of the assets of the Company or any of its Affiliates; (ii) a material reduction in your base salary other than one temporary reduction of not more than 120 days and not in excess of 20% of your base salary in connection with and in proportion to a general reduction of the base salaries of the Company's executive officers; (iii) relocation of your office more than 35 miles from Lexington, Massachusetts; or (iv) material breach by the Company of any material provision of this Agreement or any other service-providing agreement between the Company or any of its Affiliates and you.

iii. " ***Change of Control*** "shall mean (i) the acquisition of beneficial ownership (as defined in Rule 13d-3 under the Exchange Act) directly or indirectly by any "person"(as such term is used in Sections 13(d) and 14(d) of the Exchange Act), of securities of the Company representing a majority or more of the combined voting power of the Company's then outstanding securities, other than an acquisition of securities for investment purposes pursuant to a bona fide financing of the Company; (ii) a merger or consolidation of the Company with any other corporation in which the holders of the voting securities of the Company prior to the merger or consolidation do not own more than 50% of the total voting securities of the surviving corporation; (iii) the sale or disposition by the Company of all or substantially all of the Company's assets other than a sale or disposition of assets to an entity whose equity interests are held, directly or indirectly, entirely by the same persons and in the same proportions as the equity interests of the Company; or (iv) a change in the composition of the Board that results, during any one year period, in the Continuing Directors' no longer constituting a majority of the Board (or, if applicable, the board of directors of a successor corporation to the Company), where the term " ***Continuing Director*** "means at any date a member of the Board (x) who was a member of the Board on __________ or (y) who was nominated or elected subsequent to such date by at least a majority of the directors who were Continuing Directors at the time of such nomination or election or whose election to the Board was recommended or endorsed by at least a majority of the directors who were Continuing Directors at the time of such nomination or election; *provided, however* , that there shall be excluded from this clause (y) any individual whose initial assumption of office after January 10, 2014 occurred as a result of an actual or threatened election contest with respect to the election or removal of directors or other actual or threatened solicitation of proxies or consents, by or on behalf of a person other than the Board.

8. **Withholdings; Section 409A.** Anything to the contrary notwithstanding, (a) all payments required to be made by the Company hereunder to you shall be subject to the withholding of such amounts, if any, relating to tax and other payroll deductions as the Company may reasonably determine it should withhold pursuant to any applicable law or regulation, and (b) if and to the extent any portion of any payment, compensation or other benefit provided to you in connection with your employment termination is determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A and you are a specified employee as defined in Section 409A(a)(2)(B)(i), as determined by the Company in accordance with its procedures, by which determination you hereby agree that you are bound, such portion of the payment, compensation or other benefit shall not be paid before the earlier of (i) the expiration of the six month period measured from the date of your "separation from service"(as determined under Section 409A) or (ii) the tenth day following the date of your death following such separation from service (the " ***New Payment Date*** "). The aggregate of any payments that otherwise would have been paid to you during the period between the date of separation from service and the New Payment Date shall be paid to you in a lump sum in the first payroll period beginning after such New Payment Date, and any remaining payments will be paid on their original schedule. For purposes of this Agreement, (i) each amount to be paid or benefit to be provided shall be construed as a separate identified payment for purposes of Section 409A, (ii) neither you nor the Company shall have the right to accelerate or defer any payment or benefit hereunder unless permitted or required by Section 409A, and (iii) any payments that are due within the "short term deferral period" as defined in Section 409A or paid in a manner consistent with Treas. Reg. § 1.409A-1(b)(9)(iii) shall not be treated as deferred compensation unless applicable law requires otherwise. The terms of this employment letter are intended to be compliant with, or exempt from, Section 409A; provided, however, that the Company shall have no liability to you or to any other person in the event that the employment letter terms are determined not to be so compliant or exempt.

9. **Parachute Taxation.** The Company will make any payments due to you without regard to whether Section 280G of the Code would limit or preclude the deductibility of such payments (or any other payments or benefits) and without regard to

whether such payments would subject you to the federal excise tax levied on certain "excess parachute payments" under Section 4999 of the Code; provided, however, that if the Total After-Tax Payments (as defined below) would be increased by the reduction or elimination of any payment and/or other benefit (including the vesting of any equity awards), then the amounts payable under this Agreement or otherwise will be reduced or eliminated as follows, as determined by the Company, in the following order: (i) nonacceleration of any stock options whose exercise price is at or above the fair market value of the Company's common stock as determined in the discretion of the Compensation Committee (taking into account, as appropriate, the proceeds that would be received in connection with the event covered by Section 4999) (" ***Underwater Options*** "), (ii) nonacceleration of any stock options other than Underwater Options, (iii) any vesting or distribution of restricted stock or restricted stock units, (iv) any other taxable benefits, (v) any nontaxable benefits, and (vi) the cash severance due under Section 7(a) above. Within each category described in clauses (i), (ii), and (iii), reductions or eliminations shall be made in reverse order beginning with vesting or distributions that are to be paid the farthest in time from the date of the event covered by Section 4999. The Company's independent, certified public accounting firm will determine whether and to what extent payments or vesting under this Agreement are required to be reduced in accordance with the preceding sentence. If there is an underpayment or overpayment under this Agreement (as determined after the application of this paragraph), the amount of such underpayment or overpayment will be immediately paid to you or refunded by you, as the case may be, with interest at the applicable federal rate provided for in Section 7872(f)(2) of the Code. For purposes of this Agreement, " ***Total After-Tax Payments*** "means the total of all "parachute payments"(as that term is defined in Section 280G(b)(2) of the Code) made to you or for your benefit (whether made under the Agreement or otherwise), after reduction for all applicable federal taxes (including the tax described in Section 4999 of the Code).

10. **Miscellaneous.**

(a) ***Notices.*** All notices required or permitted under this Agreement must be in writing and will be deemed effective upon personal delivery or three business days following deposit in a United States Post Office, by certified mail, postage prepaid, or one business day after it is sent for next-business day delivery via a reputable nationwide overnight courier service addressed in the case of notice to the Company at its then principal headquarters (with copies to the Chairman of the Board and the Company's General Counsel, which will not constitute notice), and in the case of notice to you to the current address on file with the Company. Either Party may change the address to which notices are to be delivered by giving notice of such change to the other Party in the manner set forth in this Section 10(a)

(b) ***No Mitigation.*** You are not required to seek other employment or otherwise mitigate the value of any severance benefits contemplated by this Agreement, nor will any such benefits be reduced by any earnings or benefits that you may receive from any other source. Notwithstanding any other provision of this Agreement, any sum or sums paid under this Agreement will be in lieu of any amounts to which you may otherwise be entitled under the terms of any severance plan, policy, program, agreement or other arrangement sponsored by the Company or an affiliate of the Company.

(c) ***Waiver of Jury Trial.*** TO THE EXTENT NOT PROHIBITED BY APPLICABLE LAW THAT CANNOT BE WAIVED, THE PARTIES HEREBY WAIVE, AND COVENANT THAT THEY WILL NOT ASSERT (WHETHER AS PLAINTIFF, DEFENDANT OR OTHERWISE), ANY RIGHT TO TRIAL BY JURY IN ANY ACTION, SUIT OR OTHER PROCEEDING ARISING IN WHOLE OR IN PART UNDER OR IN CONNECTION WITH THIS AGREEMENT OR THE RELEASE IT CONTEMPLATES, WHETHER NOW EXISTING OR HEREAFTER ARISING, AND WHETHER SOUNDING IN CONTRACT, TORT OR OTHERWISE. THE PARTIES AGREE THAT ANY PARTY MAY FILE A COPY OF THIS PARAGRAPH WITH ANY COURT AS WRITTEN EVIDENCE OF THE KNOWING, VOLUNTARY AND BARGAINED-FOR AGREEMENT AMONG THE PARTIES IRREVOCABLY TO WAIVE THEIR RIGHTS TO TRIAL BY JURY IN ANY PROCEEDING WHATSOEVER BETWEEN THEM RELATING TO THIS AGREEMENT OR TO ANY OF THE MATTERS CONTEMPLATED UNDER THIS AGREEMENT, RELATING TO YOUR EMPLOYMENT, OR COVERED BY THE CONTEMPLATED RELEASE.

(d) ***Severability.*** Each provision of this Agreement is intended to be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement is held to be prohibited by or invalid under applicable law, such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement. Moreover, if an arbitrator or a court of competent jurisdiction determines any of the provisions contained in this Agreement to be unenforceable because the provision is excessively broad in scope, whether as to duration, activity, geographic application, subject or otherwise, it will be construed, by limiting or reducing it to the extent legally permitted, so as to be enforceable to the extent compatible with then applicable law to achieve the intent of the Parties.

(e) ***Assignment.*** This Agreement will be binding upon and will inure to the benefit of (i) your heirs, beneficiaries, executors and legal representatives upon your death and (ii) any successor of the Company. Any such successor of the Company will be treated as substituted for the Company under the terms of this Agreement for all purposes. The Company may assign this Agreement without your consent, and such an assignment will not terminate your employment for purposes of triggering your entitlement to severance. You specifically agree that any assignment may include rights under the Confidentiality Agreement without requiring your consent. As used herein, " ***successor*** "will mean any person, firm, corporation or other business entity that at any time, whether by purchase, merger or otherwise, directly or indirectly acquires all or substantially all of the assets or business of the Company and its subsidiaries. None of your rights to receive any form of compensation payable under this Agreement will be assignable or transferable except through a testamentary disposition or by the laws of descent and distribution upon your death or as provided in Section 10(k). Any attempted assignment, transfer, conveyance or other disposition of any interest in your rights to receive any form of compensation hereunder, except as provided in the preceding sentence, will be null and void.

(f) ***No Oral Modification, Waiver, Cancellation or Discharge.*** This Agreement may only be amended, canceled or discharged or any obligations thereunder waived through a writing signed by you and the Board or any duly authorized executive officer of the Company.

(g) ***No Conflict of Interest.*** You confirm that you have fully disclosed to the Company and its affiliates, to the best of your knowledge, any circumstances under which you, your immediate family and other persons who reside in your household have or may have a conflict of interest with the Company. You further agree to fully disclose to the Company any such circumstances that might arise during your employment upon your becoming aware of such circumstances.

(h) ***Other Agreements.*** You hereby represent that your performance of all the terms of this Agreement and the performance of your duties as an employee of the Company does not and will not breach any agreement to keep in confidence proprietary information, knowledge or data acquired by you in confidence or in trust prior to your employment with the Company. You also represent that you are not a party to or subject to any restrictive covenants, legal restrictions, policies, commitments or other agreements in favor of any entity or person that would in any way preclude, inhibit, impair or limit your ability to perform your obligations under this Agreement, including noncompetition agreements or nonsolicitation agreements, and you further represent that your performance of the duties and obligations under this Agreement does not violate the terms of any agreement to which you are a party. You agree that you will not enter into any agreement or commitment or agree to any policy that would prevent or unreasonably hinder your performance of duties and obligations under this Agreement.

(i) ***Disclosure of this Agreement.*** You acknowledge that the Company may provide persons or entities who may employ or engage you with a copy of the Confidentiality Agreement (or portions thereof) to highlight your continuing obligations to the Company. You also acknowledge that the Company may be obligated to disclose this Agreement or any portion thereof to satisfy applicable laws and regulations.

(j) ***Survivorship.*** The respective rights and obligations of the Company and you hereunder will survive any termination of your employment to the extent necessary to preserve the intent of such rights and obligations.

(k) ***Beneficiaries.*** You will be entitled, to the extent applicable law permits, to select and change the beneficiary or beneficiaries to receive any compensation or benefit payable hereunder upon your death by giving the Company written notice thereof in a manner consistent with the terms of any applicable plan documents. If you die, severance then due or other amounts due hereunder will be paid to your designated beneficiary or beneficiaries or, if none are designated or none survive you, your estate.

(l) ***Company Policies.*** References in this Agreement to Company policies and procedures are to those policies and procedures in effect at the Effective Date, as the Company may amend them from time to time.

(m) ***Governing Law; Dispute Resolution.*** This Agreement must be construed, interpreted, and governed in accordance with the laws of the Commonwealth of Massachusetts without reference to rules relating to conflict of law. The Parties agree that the Federal Arbitration Act, 9 U.S.C. §1 et seq. and the American Arbitration Association's National Rules for the Resolution of Employment Disputes (the " ***National Rules*** ") apply to the interpretation and enforcement of this Agreement. In case of any controversy, dispute, or claim directly or indirectly arising out of or related to this Agreement, or the breach thereof, or relating to your employment (including claims relating to employment discrimination), except as expressly excluded herein, each Party agrees to give the other Party notice of an intent to seek arbitration under this Agreement and 10 days to reach a resolution. Should resolution of any controversy or claim not be reached following provision of notice and a reasonable opportunity to cure, then the Parties agree that any controversy or claim arising out of or relating to this Agreement, including the arbitrability of the dispute itself, shall be settled by one arbitrator in accordance with the National Rules in effect at the time the arbitration demand is filed or such other rules as may be mutually agreed to by the Parties. The dispute will be arbitrated in Boston, Massachusetts, absent mutual agreement of the Parties to another venue. Any claim or controversy not submitted to arbitration in accordance with this Section 10(m) (other than as provided under the Confidentiality Agreement) will be waived, and thereafter no arbitrator, arbitration panel, tribunal, or court will have the power to rule or make any award on any such claim or controversy. In determining a claim or controversy under this Agreement and in making an award, the arbitrator must consider the terms and provisions of this Agreement, as well as all applicable federal, state, or local laws. The award rendered in any arbitration proceeding held under this Section 10(m) will be final and binding and judgment upon the award may be entered in any court having jurisdiction thereof. Claims for workers' compensation or unemployment compensation benefits are not covered by this Section 10(m). Also not covered by this Section 10(m) are claims by the Company or by you for temporary restraining orders, preliminary injunctions or permanent injunctions (" ***equitable relief*** ") in cases in which such equitable relief would be otherwise authorized by law or pursuant to the Confidentiality Agreement. The Company will be responsible for paying any filing fee of the sponsoring organization and the fees and costs of the arbitrator; provided, however, that if you initiate the claim, you will contribute an amount equal to the filing fee you would have incurred to initiate a claim in the court of general jurisdiction in the Commonwealth of Massachusetts. Each party will pay for its own costs and attorneys' fees, if any, provided that the arbitrator or court, as applicable, may award reasonable costs and expenses in favor of the prevailing party. The Company and you agree that the decision as to whether a party is the prevailing party in an arbitration, or a legal proceeding that is commenced in connection therewith, will be made in the sole discretion of the arbitrator or, if applicable, the court. Any action, suit or other legal proceeding with respect to equitable relief that is excluded from arbitration above must be commenced only in a court of the Commonwealth of Massachusetts (or, if appropriate, a federal court located within the Commonwealth of Massachusetts), and the Company and you each consent to the jurisdiction of such a court. With respect to any such court action, the Parties hereto (i) submit to the personal jurisdiction of such courts; (ii) consent to service of process by the means specified under Section 10(a); and (iii) waive any other requirement (whether imposed by statute, rule of court, or otherwise) with respect to personal jurisdiction, inconvenient forum, or service of process.

(n) ***Interpretation.*** The parties agree that this Agreement will be construed without regard to any presumption or rule requiring construction or interpretation against the drafting party. References in this Agreement to "include" or "including" should be read as though they said "without limitation" or equivalent forms. References to "day" or "days" are to calendar days, unless the Agreement specifically refers to "business" days.

(o) ***Entire Agreement.*** This Agreement and any documents referred to herein represent the entire agreement of the Parties and will supersede any and all previous contracts, arrangements or understandings between the Company and you relating to matters covered by this Agreement.

Very truly yours,

/s/ Roger D. Tung

President and Chief Executive Officer

Agreed and Accepted:

Signature:

Date:

Exhibit 10.11

Concert Pharmaceuticals Inc.

VIA HAND DELIVERY

March 1, 2017

Ian Robert Silverman
c/o Concert Pharmaceuticals, Inc.
99 Hayden Avenue, Suite 500
Lexington, MA 02421

Dear Bob:

This letter agreement (the “Letter Agreement”) revises the terms of your continued employment at Concert Pharmaceuticals, Inc. (the “Company). The parties hereby acknowledge and agree that beginning June 1, 2017 (the “Transition Date”), your title will become a senior legal advisor employed by the Company reporting to the Company’s Chief Executive Officer. Further, the parties hereby acknowledge and agree that the employment agreement between the parties dated June 13, 2014 will terminate as of the Transition Date.

Following the Transition Date, you will receive a base salary of $345,933 per year payable in accordance with the regular payroll practices of the Company, as in effect from time to time, and subject to increase from time to time by the Company in its discretion. During your employment, you may be considered annually for a bonus and/or stock option grant in addition to your base salary. Bonus compensation and/or stock option grants in any year, if any, may be awarded at the discretion of the Company based on your performance and that of the Company, in accordance with a general bonus program as established by the Board’s Compensation Committee.

You will be entitled to participate in all employee benefit plans from time to time in effect for employees of the Company generally, except to the extent such plans are duplicative of benefits otherwise provided under any other agreement. Your participation will be subject to the terms of the applicable plan documents and generally applicable Company policies.

You represent that you have complied and agree that you will continue to comply with the Employee Confidential, Non-Competition and Proprietary Information Agreement between the Company and you dated November 30, 2006, which will remain in full force and effect.

This letter is not intended to create or constitute an employment agreement or contract (express or implied) between you and the Company for any period of employment. Please also understand that your employment relationship with the Company is “at will,” meaning that you or the Company has the right to terminate our employment relationship at any time.

Very truly yours,

Accepted and Agreed	By: /s/ Roger D. Tung
By: /s/ Ian Robert Silverman	1 March 2017
	Date

Exhibit 10.12

Asset Purchase Agreement

Dated as of March 3, 2017

between

Concert Pharmaceuticals, Inc.,
as Seller

and

Vertex Pharmaceuticals (Europe) Limited,
as Buyer

and, solely for purposes of Section 10.14 herein,

Vertex Pharmaceuticals Incorporated,
as Guarantor

The Asset Purchase Agreement (the "Agreement") contains representations, warranties and covenants that were made only for purposes of the Agreement and as of specific dates; were solely for the benefit of the parties to the Agreement; may be subject to limitations agreed upon by the parties, including being qualified by confidential disclosures made for the purposes of allocating contractual risk between the parties to the Agreement instead of establishing these matters as facts; and may be subject to standards of materiality applicable to the contracting parties that differ from those applicable to investors. Investors should not rely on the representations, warranties and covenants or any description thereof as characterizations of the actual state of facts or condition of the contracting parties, or any of their respective subsidiaries or affiliates. Moreover, information concerning the subject matter of the representations, warranties and covenants may change after the date of the Agreement, which subsequent information may or may not be fully reflected in public disclosures by the contracting parties.

Table of Contents

Page

Page

EXHIBITS

ASSET PURCHASE AGREEMENT

This ASSET PURCHASE AGREEMENT (this "**Agreement**") is entered into as of March 3, 2017 between Concert Pharmaceuticals, Inc., a Delaware corporation ("**Seller**"), Vertex Pharmaceuticals (Europe) Limited, a U.K. limited company ("**Buyer**"), and, solely for purposes of Section 10.14 herein, Vertex Pharmaceuticals Incorporated, a Massachusetts corporation ("**Guarantor**"). Seller and Buyer are sometimes referred to herein individually as a "**Party**" and together as the "**Parties**."

WHEREAS, Seller is a biopharmaceutical company engaged in the synthesis, research and development of compounds as potential therapeutic products for treating cystic fibrosis, including the generation of Intellectual Property associated therewith (the "**CF Enterprise**").

WHEREAS, upon the terms and subject to the conditions set forth in this Agreement, Seller desires to sell, convey, assign, transfer and deliver to Buyer, and Buyer desires to purchase, acquire and accept from Seller, the Acquired Assets (as defined below), and assume, pay, perform and discharge from Seller certain Liabilities (as defined below) related to the Acquired Assets, upon the terms and subject to the conditions set forth herein.

WHEREAS, Guarantor desires to guaranty certain obligations of Buyer hereunder.

WHEREAS, concurrently with the execution and delivery of this Agreement, Seller and Buyer are entering into that certain Research and Testing Agreement (the "**Research and Testing Agreement**") dated as of the date hereof.

NOW, THEREFORE, in consideration of the respective representations, warranties, covenants and agreements herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, hereby agree as follows:

ARTICLE I

ASSET PURCHASE

Section 1.01 Sale of Assets; Assumption of Liabilities.

(a) Transfer of Assets. On the terms and subject to the conditions of this Agreement, at the Closing, Seller shall sell, convey, assign, transfer and deliver to Buyer and its assignees under Section 10.06 hereof (collectively, the "**Buyer Group**"), and Buyer shall, or shall cause the applicable member of the Buyer Group to, purchase, acquire and accept assignment from Seller, all of Seller's right, title and interest in and to those assets used, planned for use or held for use, in each case, in the ownership, operation or conduct of the CF Enterprise as currently, and currently expected to be, owned, operated and conducted (collectively, the "**Acquired Assets**"), free and clear of all Encumbrances (other than Permitted Encumbrances), including the following:

(i) all rights to Develop, Manufacture and Commercialize the Transferred Products, including all rights and claims to all clinical study data, reports and analyses to the extent related to the Transferred Products, including those identified on Section 1.01(a)(i) of the Seller Disclosure Letter;

(ii) all Intellectual Property related to the Transferred Products that exists now or as of the Closing anywhere in the world, including: (A) all Intellectual Property claiming any aspect of, or relating to Seller's Development, Manufacturing, and/or Commercialization activities in respect of the Transferred Products on or before the Closing Date, including Transferred Know-How; (B) any rights which an employee, consultant, agent, inventor, author or third party is obligated by contract, statute or otherwise to assign to Seller; (C) all rights of action arising from the foregoing, including all claims for damages by reason of present, past and future infringement, misappropriation, violation misuse or breach of contract in respect of the foregoing; (D) present, past and future rights to sue and collect damages or seek injunctive relief for any such infringement, misappropriation, violation, misuse or breach; and (E) all income, royalties and any other payments now and hereafter due and/or payable to Seller in respect of the foregoing (collectively, the "**Transferred IP**");

(iii) all documentation or other tangible embodiments that comprise, embody, disclose or describe the Transferred IP, including engineering drawings, technical documentation, databases, spreadsheets, business records, inventors' notebooks, invention disclosures, digital files, software code and patent, trademark and copyright prosecution files, including any such files in the custody of outside legal counsel (collectively, the "**Transferred IP Documentation**"); provided, however, that (A) freedom-to-operate opinions of counsel related to the Intellectual Property of Buyer, (B) minutes, consents, resolutions and other materials prepared for or by the Seller Board and (C) documentation and other tangible embodiments covered by the attorney-client privilege associated with the Acquired Assets, including the transactions contemplated by this Agreement, shall each be deemed an Excluded Asset and shall remain with Seller;

(iv) all rights, title and interest in the Contracts relating to the Transferred Products or Transferred IP, including all Contracts that contain any grant to Seller of any right relating to or under Intellectual Property rights of any Person that is used or held for use by Seller in connection with the Transferred Products, each of which is identified on Section 1.01(a)(iv) of the Seller Disclosure Letter (the "**Assigned IP Contracts**"), and each other Contract related to the Transferred Products, each of which is identified on Section 1.01(a)(iv) of the Seller Disclosure Letter (together with the Assigned IP Contracts, the "**Assigned Contracts**");

(v) the Transferred Registrations related to the Transferred Products;

(vi) other than the Transferred Registrations, all qualifications, permits, registrations, clearances, applications, submissions, variances, exemptions, filings, approvals and authorizations which relate primarily to the Transferred Products (collectively, "**Permits**"), including those identified on Section 1.01(a)(vi) of the Seller Disclosure Letter (the "**Transferred Permits**");

(vii) copies of all customer and supplier lists, marketing studies, consultant reports, books and records (financial, laboratory and otherwise), files, invoices, billing records, distribution lists, manuals (in all cases, in any form or medium), but excluding Tax Returns other than Tax Returns solely related to the Acquired Assets, patient support and market research programs and related databases, and all complaint files and adverse event files, in each case, to the extent (1) related to the Transferred Products and (2) in Seller's or any of its Affiliates' possession or under its control as of the Closing Date;

(viii) all Transferred Product Records, including Acquired Assets Regulatory Filings, to the extent not covered by any of the foregoing;

(ix) all third-party warranties, indemnities and guarantees relating to any of the Acquired Assets or the Assumed Liabilities;

(x) all claims, defenses and rights of offset or counterclaim (at any time or in any manner arising or existing, whether choate or inchoate, known or unknown, contingent or non-contingent) relating to any of the Acquired Assets or the Assumed Liabilities;

(xi) all goodwill arising from, associated with or relating to the Acquired Assets, including rights under any confidentiality Contracts executed by any third party for the benefit of Seller in connection with the Acquired Assets;

(xii) all Transferred Inventory; and

(xiii) the Transferred Products.

Notwithstanding anything to the contrary in this Agreement, the Acquired Assets shall not include any Excluded Assets.

(b) Excluded Assets. It is expressly understood and agreed that "**Excluded Assets**" means all assets, properties and rights of Seller other than the Acquired Assets, including, but not limited to, those set forth on Section 1.01(b) of the Seller Disclosure Letter, the DCE Platform Know-How and the Excluded Therapeutic Products. For the avoidance of doubt, all Transferred Products shall be included in the Acquired Assets.

In the event of any inconsistency or conflict that may arise in the application or interpretation of this definition or the definition of "Acquired Assets," for purposes of determining what is and is not an Excluded Asset or an Acquired Asset, the explicit inclusion of an item on Section 1.01(b) of the Seller Disclosure Letter shall take priority over any textual provision of this definition that would otherwise operate to exclude such asset from the definition of "Excluded Assets" or include such asset in the definition of "Acquired Assets," as applicable.

(c) DCE Platform Know-How and Non-Exclusive License. Seller hereby grants to Buyer, effective as of the Closing Date, a world-wide, non-exclusive, perpetual, irrevocable, sublicensable, royalty-free, fully-paid license to DCE Platform Know-How for the use in the Development, Manufacture and Commercialization of the Transferred Products and other therapeutic products. Seller shall disclose to Buyer DCE Platform Know-How that is necessary or useful for the ownership, Development, Manufacture and Commercialization of the Transferred Products, and shall have no further disclosure obligation under this Agreement with respect to DCE Platform Know-How.

(d) Assumed Liabilities. On the Closing Date, Buyer shall, or shall cause the applicable member of the Buyer Group to, deliver to Seller one or more assumption agreements in the form attached hereto as Exhibit A (the "**Assumption Agreements**"), pursuant to which Buyer, or the applicable member of the Buyer Group, on and as of the Closing Date, shall, among other things, assume and agree to pay, perform and discharge when due only the following Liabilities primarily relating to the Acquired Assets (the "**Assumed Liabilities**"), and Buyer does not hereby assume or become obligated to pay or perform any other Liabilities of Seller that arise out of or in respect of any of its operations on or prior to the Closing, except for the following:

(i) all Liabilities relating to, arising out of, based upon or resulting from the use, ownership, possession or operation of the Acquired Assets by Buyer or its Affiliates after the Closing;

(ii) all Liabilities identified on Section 1.01(d) of the Seller Disclosure Letter;

(iii) all Liabilities under the Assigned Contracts first arising in respect of the period after the Closing (other than any Liability arising out of or relating to a default or breach existing at, prior to, or as a consequence of the Closing); and

(iv) all Liabilities for Taxes attributable to a Post-Closing Tax Period.

(e) Excluded Liabilities. It is expressly understood and agreed that, notwithstanding anything to the contrary in this Agreement, Buyer shall not assume, or cause to be assumed, or be deemed to have assumed or be liable or responsible for any Liabilities (whether now existing or arising after the date hereof) of Seller or any of its Affiliates relating to, arising out of, based upon or resulting from the use, ownership, possession or operation of the Acquired Assets by Seller or its Affiliates on or prior to the Closing, including (i) those Liabilities set forth on Section 1.01(e) of the Seller Disclosure Letter, (ii) any Indebtedness of Seller or any of its Affiliates, (iii) any expenses incurred by, or for the benefit of, Seller or any of its Affiliates in connection with the preparation, execution or consummation or performance of the transactions contemplated by this Agreement and the Related Agreements, including all legal, accounting, Tax advisory, investment banking and other professional fees and expenses, and (iv) any Liability incurred in connection with the open-label Phase 2 clinical trial of CTP-656 in Europe (such Liabilities not assumed hereunder, the "**Excluded Liabilities**") and the Excluded Liabilities shall remain the sole obligation and responsibility of Seller.

In the event of any inconsistency or conflict that may arise in the application or interpretation of this definition or the definition of "Assumed Liabilities," for purposes of determining what is and is not an Excluded Liability or an Assumed Liability, the explicit inclusion of an item on Section 1.01(d) of the Seller Disclosure Letter shall take priority over any textual provision of this definition that would otherwise operate to exclude such Liability from the definition of "Excluded Liabilities" or include such Liability in the definition of "Assumed Liabilities," as applicable.

Section 1.02 Consideration.

(a) Upfront Consideration. On the terms, and subject to the conditions, set forth in this Agreement, as partial consideration for the Acquired Assets, and subject to the terms and conditions of this Agreement, at the Closing, Buyer shall, or shall cause the applicable member of the Buyer Group to, (i) assume the Assumed Liabilities, (ii) pay to Seller, by wire transfer of immediately available funds, the Base Purchase Price, less the Escrow Amount, and (iii) pay to the Escrow Agent the Escrow Amount.

(b) Contingent Consideration. As additional consideration for the Acquired Assets, Buyer shall pay to Seller, pursuant to this Section 1.02(b), the contingent payment (each a "**Contingent Payment**") set forth below based on the achievement by or on behalf of Buyer or its Affiliates, licensees, sublicensees or transferees of the corresponding Milestone Event set forth below. For the avoidance of doubt, notwithstanding anything to the contrary in this Agreement, a Contingent Payment shall be due and payable only once (and only one Contingent Payment shall be payable with respect to each Milestone Event) and shall be paid by Buyer to Seller promptly, but in no event later than forty-five (45) calendar days following the occurrence of the applicable Milestone Event by wire transfer of immediately available funds to the account designated in writing by Seller to Buyer.

Milestone Event	Contingent Payment
Receipt of marketing approval from the FDA of a combination treatment regimen for the treatment of patients with cystic fibrosis that contains CTP-656	$50,000,000
Completion of a pricing and reimbursement agreement in the United Kingdom, Germany or France with respect to a combination treatment regimen for the treatment of patients with cystic fibrosis that contains CTP-656	$40,000,000

(c) No Diligence Obligation. From and after the Closing, Buyer shall, in its sole and absolute discretion, make all decisions with respect to the Development, Manufacture and Commercialization of the Acquired Assets and shall have no obligation to undertake any efforts to achieve the Milestone Events.

Section 1.03 The Closing.

(a) Time and Location. The closing of the transactions contemplated by this Agreement (the "**Closing**") shall take place at 9:00 a.m., New York City Time, at the offices of White & Case LLP, 1155 Avenue of the Americas, New York, New York 10036-2787 as soon as possible but in no event later than the third (3rd) Business Day following the satisfaction or waiver of the last of the conditions set forth in Article V to be satisfied or (to the extent permitted) waived (other than any such conditions that by their nature are to be satisfied at the Closing, but subject to the satisfaction or (to the extent permitted) waiver of such conditions at Closing), unless another time, date or place is agreed to in writing by Seller and Buyer. The date on which the Closing actually occurs will be the "**Closing Date**".

(b) Actions at the Closing. At the Closing:

(i) Seller shall deliver (or cause to be delivered) to Buyer the various certificates, instruments and documents required to be delivered under Section 5.02 not otherwise listed in this Section 1.03(b);

(ii) Buyer shall deliver (or cause to be delivered) to Seller the various certificates, instruments and documents required to be delivered under Section 5.03 not otherwise listed in this Section 1.03(b);

(iii) Seller shall deliver (or cause to be delivered) to Buyer one or more executed Bills of Sale in substantially the form attached hereto as Exhibit B (collectively, the "**Bill of Sale**");

(iv) Seller shall deliver (or cause to be delivered) to Buyer executed Intellectual Property Assignment Agreements, in substantially the form attached hereto as Exhibit C (the "**IP Assignment Agreements**");

(v) Seller and Buyer shall deliver (or cause to be delivered) to the other one or more executed Assumption Agreements and such other instruments as Seller may reasonably request in order to effect the assignment to, and assumption by, Buyer of certain of the Acquired Assets and the Assumed Liabilities;

(vi) Seller shall deliver (or cause to be delivered) to Buyer the Transferred Product Records;

(vii) Seller and Buyer shall deliver (or cause to be delivered) to the other an executed Transition Services Agreement in substantially the form attached hereto as Exhibit D (the "**Transition Services Agreement**");

(viii) Seller shall deliver (or cause to be delivered) such other certificates, documents, instruments and writings as shall be reasonably requested by Buyer to effectively vest in Buyer title in and to the Acquired Assets, free and clear of all Encumbrances (other than Permitted Encumbrances), in accordance with the provisions of this Agreement; and

(ix) Buyer shall pay (or cause to be paid) (A) to Seller, the Base Purchase Price, less the Escrow Amount and (B) to the Escrow Agent, the Escrow Amount, in each case in accordance with Section 1.02(a).

Section 1.04 Consents to Assignment. Notwithstanding anything to the contrary contained in this Agreement, if the sale, assignment, transfer, conveyance or delivery or attempted sale, assignment, transfer, conveyance or delivery to Buyer of any asset that would be an Acquired Asset is (a) prohibited by any applicable Law or (b) would require any authorizations, approvals, consents or waivers from a Third Party or Governmental Entity and such authorizations, approvals, consents or waivers shall not have been obtained prior to the Closing, then in either case the Closing shall proceed without the sale, assignment, transfer, conveyance or delivery of such asset and this Agreement shall not constitute an agreement for the sale, assignment, transfer, conveyance or delivery of such asset; provided, that nothing in this Section 1.04 shall be deemed to waive the rights of Buyer not to consummate the transactions contemplated by this Agreement if the conditions to its obligations set forth in Article V have not been satisfied. In the event that the Closing proceeds without the sale, assignment, transfer, conveyance or delivery of any such asset, then following the Closing, Seller shall use commercially reasonable efforts to obtain promptly such authorizations, approvals, consents or waivers. Pending such authorization, approval, consent or waiver, (i) Seller will comply with the terms of, and will not amend, transfer, let lapse or terminate, its rights with respect to the applicable asset without Buyer's written consent, such consent not to be unreasonably withheld, conditioned or delayed and (ii) the Parties shall cooperate with each other in any mutually agreeable, reasonable and lawful arrangements designed to provide to Buyer the benefits of use of such asset, and to Seller the benefits, including any indemnities, that, in each case, it would have obtained had the asset been conveyed to Buyer at the Closing. To the extent that Buyer is provided the benefits pursuant to this Section 1.04 of any Contract, Buyer shall (x) perform for the benefit of the other parties thereto the obligations of Seller or any affiliate of Seller thereunder and (y) satisfy any related Liabilities with respect to such Contract that, but for the lack of an authorization, approval, consent or waiver to assign such obligations or Liabilities to Buyer, would be Assumed Liabilities. Once authorization, approval, consent or waiver for the sale, assignment, transfer, conveyance or delivery of any such asset not sold, assigned, transferred, conveyed or delivered at the Closing is obtained, Seller shall promptly assign, transfer, convey and deliver such asset to Buyer at no additional cost to Buyer.

Section 1.05 Further Assurances. Subject to the terms and conditions hereof, each of the Parties agrees to use commercially reasonable efforts to execute and deliver, or cause to be executed and delivered, all documents and to take, or cause to be taken, all actions that may be reasonably necessary or appropriate to effectuate the provisions of this Agreement, provided, that all such actions are in accordance with applicable Law. From time to time, whether at or after the Closing, (i) Seller shall execute and deliver such further documents or instruments of conveyance, transfer and assignment and take all such other action as Buyer may reasonably require to more effectively convey, transfer and assign to Buyer any and all ownership, right, title and interest in and to the Acquired Assets, including executing documents or instruments necessary to permit Buyer to record the transfer, conveyance and/or assignment of any and all Transferred IP with any Governmental Entity and (ii) Buyer, and any other member of the

Buyer Group, will execute and deliver such further instruments and take all such other action as Seller may reasonably require for such member of the Buyer Group to assume the Assumed Liabilities.

ARTICLE II

REPRESENTATIONS AND WARRANTIES OF SELLER

Except as set forth in the disclosure schedule provided by Seller to Buyer prior to the date hereof (the "**Seller Disclosure Letter**"), Seller hereby represents and warrants to Buyer as of the date hereof and as of the Closing Date as follows. The Seller Disclosure Letter shall be arranged in sections corresponding to the Sections contained in this Article II. The disclosures in any section of the Seller Disclosure Letter shall qualify other Sections in this Article II only to the extent it is reasonably clear from a reading of the disclosure that such disclosure is applicable to other Sections.

Section 2.01 **Organization, Qualification and Corporate Power**. Seller is a corporation duly organized, validly existing and in good standing under the Laws of the State of Delaware, with all requisite power and authority to own, lease and operate its properties as presently owned, leased and operated and to carry on its business as presently conducted. Seller is duly qualified to do business and is in good standing as a foreign corporation in each jurisdiction where the nature of the properties owned, leased or operated by it and the businesses transacted by it require such licensing or qualification. Section 2.01 of the Seller Disclosure Letter lists, as of the date hereof, all jurisdictions in which the property owned, leased or operated by Seller, or the nature of the business conducted by Seller makes such qualification necessary to the extent such qualification relates to any Acquired Asset, except for such failures to be so qualified that would not, individually or in the aggregate, have a Seller Material Adverse Effect. Seller has made available to Buyer prior to the date hereof copies of its organizational documents, in each case, as amended and in full force and effect as of the date hereof.

Section 2.02 **Title to Assets**. Except as set forth on Section 2.02 of the Seller Disclosure Letter, Seller has good, valid and marketable title to the Acquired Assets, free and clear of any Encumbrances (other than Permitted Encumbrances). Upon the sale, conveyance, transfer, assignment and delivery of the Acquired Assets in accordance with this Agreement, Buyer will acquire good, valid and marketable title to the Acquired Assets, free and clear of any Encumbrances (other than Permitted Encumbrances). Seller has timely paid over to the appropriate Governmental Entity all amounts required to be paid over under all escheat and unclaimed property Laws and has substantially complied with all escheat and unclaimed property Laws.

Section 2.03 **Authority**. Seller has all requisite corporate power and authority to execute and deliver (or cause to be executed and delivered) this Agreement, the Bill of Sale, the IP Assignment Agreements, the Transition Services Agreement, the Research and Testing Agreement, the Seller FDA Letter, the Seller Orphan Designation Letter and any other agreements, certificates or documents to which Seller is (or will be as of the Closing) a party (collectively, the "**Related Agreements**") and to perform its obligations hereunder and under each of the Related Agreements to which it is (or will be as of the Closing) a party. The execution and delivery by Seller of this Agreement and each of the Related Agreements to which it is (or will be as of the Closing) a party and the performance by Seller of this Agreement and its obligations hereunder and thereunder, and the consummation by Seller of the transactions contemplated hereby and thereby have been duly and validly authorized by all necessary corporate action on the part of Seller and, other than the Seller Stockholder Approval, no other corporate or other proceedings or actions on the part of Seller, its board of directors (the "**Seller Board**") or stockholders are necessary therefor. There are no appraisal or dissenters' rights under applicable Law that are applicable to the execution, delivery and performance of this Agreement or the consummation of the transactions contemplated hereby by Seller. This Agreement has been, and each Related Agreement to which it is (or will be at Closing) a party will be, duly and validly executed and delivered by Seller and (assuming this Agreement and each of the Related Agreements to which Buyer is (or will be at Closing) a party, constitutes the valid and binding obligation of Buyer) constitutes (or will constitute) a valid and binding obligation of Seller, enforceable against Seller in accordance with their respective terms, except as enforceability may be limited by bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium or other similar Laws relating to or affecting the rights of creditors generally and by general principles of equity.

Section 2.04 **No Subsidiaries.** Except for Concert Pharmaceuticals Securities Corporation and Concert Pharma U.K. Ltd., Seller has no Subsidiaries.

Section 2.05 **Non-Contravention; Consents**. Neither the execution, delivery or performance of this Agreement by Seller or any of the Related Agreements to which Seller is (or will be at Closing) a party, nor the consummation by Seller of the transactions contemplated hereby or by the Related Agreements, will (with or without the giving of notice or the lapse of time, or both):

(a) conflict with or violate any provision of the charter or bylaws or other organizational documents of Seller;

(b) create any Encumbrance (other than a Permitted Encumbrance) upon any of the Acquired Assets;

(c) require on the part of Seller any filing with, notice to, exemption from, or any Permit, authorization, consent or approval of, any Governmental Entity with respect to the Acquired Assets, except for (i) compliance by Seller with the applicable requirements of the Hart-Scott-Rodino Antitrust Improvements Act of 1976 (the "**HSR Act**") and any other applicable Antitrust Laws, (ii) the Seller Orphan Designation Letter, (iii) the Seller FDA Letter and (iv) the filing of the Proxy Statement with the SEC in preliminary and definitive forms;

(d) subject to obtaining the Third Party consents or providing the notices set forth on Section 5.02(h) of the Seller Disclosure Letter, conflict with, violate or result in a breach of, constitute a default under, result in the acceleration of, create in any party the right to accelerate, terminate, modify or cancel, require any notice, right of first offer or refusal, consent or waiver under, or result in the loss of any right or privilege under, any Assigned Contract, or other instrument to which Seller is a party or by which any of the Acquired Assets are bound; or

(e) conflict with or violate any Order or Law or other restriction of any Governmental Entity applicable to Seller, any of the Acquired Assets or any of the Assumed Liabilities,

except, in the case of clauses (b) through (e) above, for such conflicts, breaches, defaults, consents, approvals, authorizations, declarations, filings or notices which would not reasonably be expected to have a Seller Material Adverse Effect.

Section 2.06 **Vote Required**. The Seller Stockholder Approval is the only vote of the holders of any class or series of Seller's capital stock necessary to consummate the transactions contemplated hereby.

Section 2.07 **Absence of Certain Changes**. Since January 1, 2016, (a) Seller has owned, developed and operated the Acquired Assets in the Ordinary Course of the CF Enterprise, (b) there has not been any material damage, destruction or other casualty loss with respect to any Acquired Asset, whether or not covered by insurance and (c) there has not been any Effect that has had, or would reasonably be expected to have, individually or in the aggregate, a Seller Material Adverse Effect. Without limiting the generality of the foregoing, except for the transactions contemplated hereby, and except as set forth in Section 4.01(b) of the Seller Disclosure Letter, since January 1, 2016, Seller has not taken any action that, had it been taken after the date of this Agreement, would be prohibited by the terms hereof.

Section 2.08 **Real Property**. The Acquired Assets do not include any owned or leased real property.

Section 2.09 **Intellectual Property**. (a) Section 2.09(a)(i) of the Seller Disclosure Letter sets forth a complete and correct list of all issued or registered Transferred IP and applications for registration of Transferred IP owned by Seller ("**Registered Business IP**") and, specifying as to each such item, as applicable, the owner(s), jurisdiction of registration or application, the registration and/or application number and the date of registration and/or application.

(b) The Assigned IP Contracts represent all of the Contracts to which Seller is party and that are related to the Transferred IP and no additional Contracts are necessary or useful for the ownership, Development, Manufacture, Commercialization and operation of the Acquired Assets as currently conducted.

(c) Except as set forth on Section 2.09(c) of the Seller Disclosure Letter, Seller is the sole owner of all the rights, title and interest in the Transferred IP, free and clear of any and all claims, any requirement of any past (if outstanding), present or future royalty, milestone or other contingent payments, or Encumbrances (other than Permitted Encumbrances) to the Transferred IP. Seller has not transferred ownership of, or granted any license or right to use, or authorized the retention of any right or ownership interest in any Transferred IP to any Person. No Third Party IP is included in or required to exploit the Transferred IP as currently conducted or contemplated by Seller. Seller does not hold any trademarks related to the Transferred Products and, to the knowledge of Seller, there will be no impediment to Buyer's use of the name CTP-656. Seller is entitled to grant all rights that it purports to grant with respect to the DCE Platform Know-How in Section 1.01(c).

(d) The Transferred IP is sufficient for the conduct of the Development, Manufacture and Commercialization of CTP-656 after the Closing in substantially the same manner as conducted prior to the Closing and constitutes all the rights, property and assets necessary to conduct in all material respects the Development, Manufacturing and Commercialization activities as currently conducted or contemplated by Seller.

(e) The execution, delivery and performance of this Agreement and the consummation of the transactions contemplated hereby will not result in the loss, forfeiture, termination, license, or impairment of, or give rise to any obligation to transfer or to create, change or abolish, or limit, terminate, or consent to the continued use by Buyer of any rights in any Transferred IP or material Third Party IP.

(f) Except as set forth on Section 2.09(f) of the Seller Disclosure Letter, neither the use or practice of the Transferred IP relating to CTP-656 as currently used or practiced in the Ordinary Course of the ownership, Development and operation of the Acquired Assets infringes or misappropriates or otherwise violates, nor the use or practice of the Transferred IP relating to CTP-656 as used or practiced in the Ordinary Course infringed or misappropriated or otherwise violated any rights, other than rights that would be infringed, misappropriated or otherwise violated if ivacaftor were used or practiced in the same manner as CTP-656, in Intellectual Property of any Third Party ("**Third Party IP**").

(g) Except as set forth on Section 2.09(g) of the Seller Disclosure Letter, (i) the use, Manufacture or Commercialization of CTP-656 does not and will not, infringe, misappropriate or otherwise violate or conflict with any Third Party IP, and (ii) no claim, action, investigation or proceeding by or before any Governmental Entity is pending or, has been threatened claiming that the Manufacture or

Commercialization of the Transferred Products does or will infringe, misappropriate or otherwise violate or conflict with Third Party IP.

(h) Except as set forth on Section 2.09(h) of the Seller Disclosure Letter, no claim has been asserted in writing to or is pending against Seller or any of its Affiliates and, to the knowledge of Seller, there have not been any threatened claims or demands against Seller alleging that any aspect of the use or practice of the Transferred IP or the ownership, Development, Manufacture, Commercialization and operation of the Acquired Assets as currently conducted infringes or misappropriates or would infringe the rights of others in or to any Third Party IP, or challenging the validity, enforceability, right to use or ownership of any Transferred IP.

(i) Seller has not granted to any Third Party any license, ownership interest or right or option to or for the use of or under the Transferred IP.

(j) Except as set forth on Section 2.09(j) of the Seller Disclosure Letter, there are no settlements, governmental consents or governmental contracts, judgments or governmental orders entered into by Seller or imposed upon Seller that restrict Seller's rights to own or use any Transferred IP or permit any Third Parties to use any Transferred IP.

(k) Except as set forth on Section 2.09(k) of the Seller Disclosure Letter, no Transferred IP was developed, in whole or in part (i) pursuant to or in connection with the development of any professional, technical or industry standard, (ii) under contract with or using the funding or resources of any Governmental Entity, academic institution or other entity or (iii) under any grants or other funding arrangements with Third Parties, including the Cystic Fibrosis Foundation Therapeutics Incorporated. Except as set forth on Section 2.09(k) of the Seller Disclosure Letter, no current or former employee, consultant or independent contractor of the Seller who was involved in, or who contributed to, the creation or development of any Transferred IP, has performed services for the government, a university, college, or other educational institution, or a research center, during a period of time during which such employee, consultant or independent contractor was also performing services for Seller.

(l) To the knowledge of Seller, there is no, nor has there been any, infringement, misappropriation, or other violations by any Third Party of any Transferred IP, and no such claims are pending or threatened by Seller against any Person with respect to the Transferred IP.

(m) Seller has taken commercially reasonable steps and precautions to protect and maintain the Transferred IP, including to establish and preserve the confidentiality, secrecy and ownership of all of the Transferred IP for which it would be commercially reasonable to do so. No such Transferred IP has been disclosed to any Person other than Seller's Representatives who are bound by confidentiality provisions and no employee, officer, director, consultant or advisor of Seller is in violation of any material term of any employment contract or any other Contract, or any restrictive covenant, relating to the right to use confidential information of others.

(n) Except as indicated in Section 2.09(n) of the Seller Disclosure Letter, all Registered Business IP (i) has been duly maintained and has not been cancelled, allowed to expire, surrendered, or abandoned, and payment of all applicable maintenance fees for such Registered Business IP has been made and is current, (ii) is registered and/or recorded in the name of Seller, is in full force, has been duly applied for, prosecuted and registered in accordance with applicable Laws (including disclosure to the United States Patent and Trademark Office of all material prior art references); (iii) has no filings, payments or similar actions that must be taken within 120 days of the date hereof for the purposes of obtaining, maintaining, perfecting or renewing such registration of Registered Business IP; (iv) has no unsatisfied past or outstanding maintenance or renewal obligation; and (v) has not been and is not involved in any inter partes review, opposition, cancellation, interference, reissue, reexamination or other similar proceeding. All Registered Business IP is subsisting and, except for any Registered Business IP that is a pending patent application, valid and enforceable.

(o) Except as set forth on Section 2.09(o) of the Seller Disclosure Letter, each Person who has or had access to any trade secrets or confidential information contained in the Transferred IP is subject to a valid and binding written agreement requiring such Person to keep such information confidential. Each Person who has developed or is or was involved in the development of any Transferred IP owned or purported to be owned by Seller has signed a valid and binding agreement confirming that Seller owns such owned Transferred IP.

(p) Except as set forth on Section 2.09(p) of the Seller Disclosure Letter, Seller has secured valid written present assignments from all consultants and employees who contributed to the creation or development of any Transferred IP owned or purported to be owned by Seller and of the rights to such contributions.

(q) Section 2.09(q) of the Seller Disclosure Letter sets forth a list of the Transferred Products and the Development status of each such Transferred Product.

Section 2.10 Contracts. (a) Section 2.10(a) of the Seller Disclosure Letter sets forth a complete and correct list of each Contract to which Seller or any of its Affiliates is a party that relates to the Acquired Assets and that is (each, a "**Material Contract**"):

(i) a Contract providing for payments by or to any Person in excess of $100,000 over any twelve (12) month period;

(ii) a Contract relating to any partnership, commercial collaboration or joint venture or other agreement involving a sharing of profits, losses, costs or Liabilities by Seller or any of its Affiliates with any other Person;

(iii) a Contract with any Governmental Entity, other than any MTAs or CTAs;

(iv) a Contract relating to the acquisition or disposition of any assets outside the Ordinary Course, including any securities purchase agreements, asset purchase agreements, merger agreements, business combination agreements and any earn-out or agreement for the deferred payment of purchase price entered into in connection therewith;

(v) an Assigned Contract;

(vi) a Contract relating to the manufacture, storage, distribution or commercialization of the Transferred Products;

(vii) a Contract relating to the research or development of the Transferred Products, excluding any NDAs, MTAs and CTAs;

(viii) a Contract that is a confidentiality or non-disclosure agreement, other than those related to business development activities ("**NDAs**"), material transfer (or other similar research) agreement ("**MTAs**") or clinical trial agreement ("**CTAs**");

(ix) a Contract relating to the testing, auditing or controlling of the Transferred Products, including any pharmacovigilance Contracts and quality Contracts;

(x) a Contract that: (A) contains a covenant by Seller not to compete or otherwise limits the freedom of Seller from engaging in the research, ownership, operation, development, manufacture, distribution or commercialization of the Transferred Products; (B) grants any rights of exclusivity to any Person; (C) grants any right of first refusal, first offer, first negotiation or similar preferential right; (D) grants any "most favored customer," "most favored supplier" or similar rights to any Person; or (E) contains a "requirements" obligation requiring Seller to purchase a designated portion of any type of material; or

(xi) a Contract that is otherwise material to the Acquired Assets.

(b) Each of the Material Contracts is in full force and effect and constitutes a legal, valid and binding agreement of Seller, and to the knowledge of Seller, each other party thereto, enforceable in accordance with its terms, subject to bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium or similar Laws of general application affecting or relating to the enforcement of creditors' rights generally, and subject to general principles of equity. Neither Seller, nor, to the knowledge of Seller, any other party thereto is (with or without notice or lapse of time, or both) in material breach or default in the performance, observance or fulfillment of any obligation or covenant contained in any Material Contract, nor does there exist any condition which upon the passage of time or the giving of notice or both, would reasonably be expected to cause such material violation of or material default under or permit the termination or modification of, or acceleration of any obligation under, any Material Contract. Seller has not given or received written or, to the knowledge of Seller, oral notice to or from any Person relating to any such actual or alleged, breach or default. Seller has not received any written or, to the knowledge of Seller, oral notice from a Third Party stating that such Third Party intends to terminate any Material Contract and Seller has not waived any right under the Material Contracts. True and complete copies of all Material Contracts including all schedules, exhibits, appendices, amendments, modifications and waivers relating thereto have been made available to Buyer, except to the extent such Material Contracts have been redacted to (i) enable compliance with Laws relating to antitrust or the safeguarding of data privacy; (ii) comply with confidentiality obligations owed to Third Parties; or (iii) exclude information not related to the Acquired Assets.

Section 2.11 Litigation. There is not, and has never been, a claim, complaint, action, suit, proceeding, hearing or investigation initiated or, to the knowledge of Seller, threatened, before any Governmental Entity or arbitral body relating to the Acquired Assets, Assumed Liabilities, the CF Enterprise, this Agreement or the transactions contemplated hereby (but excluding any claim, complaint, action, suit, proceeding, hearing or investigation solely relating to any Excluded Assets and any sealed qui tam cases). There are no outstanding Orders of any Governmental Entity or arbitral body affecting the Acquired Assets, Assumed Liabilities, the CF Enterprise, this Agreement or the transactions contemplated hereby. No product liability claims have been received in writing by Seller and, to the knowledge of Seller, no such claims have been threatened, in each case, with respect to the Transferred Products.

Section 2.12 Regulatory Matters. (a) Seller holds all Permits required under the Federal Food, Drug and Cosmetic Act of 1938, as amended (the "**FDCA**"), the Public Health Service Act of 1944, as amended (the "**PHSA**"), and the regulations of the United States Food and Drug Administration (the "**FDA**") promulgated thereunder, and similar Laws of any other similar Governmental Entity (each a "**Regulatory Authority**") required in connection with the Acquired Assets, including but not limited to the Seller's Development, Manufacture, storage, distribution, import, and export of the Transferred Products (the "**Acquired Assets Permits**"). Seller is in compliance in all material respects with the terms of the Acquired Assets Permits. Seller has timely filed all material regulatory reports, schedules, statements, documents, filings, submissions, forms, registrations, notices and other documents, together with any amendments required to be made with respect thereto, that each was required to file with any

Regulatory Authority related to the Acquired Assets ("**Acquired Assets Regulatory Filings**"), and has timely paid all Taxes, fees and assessments due and payable in connection therewith. All such Acquired Assets Regulatory Filings complied in all material respects with applicable Law. All such Acquired Assets Regulatory Filings are included within the Acquired Assets.

(b) All preclinical and clinical studies or tests conducted by or on behalf of Seller related to the Acquired Assets have been conducted in compliance with applicable Law, rules, Regulatory Authority guidance, including the provisions of the FDA's current good clinical practices regulations at 21 C.F.R. Parts 50, 54, 56 and 312 and the FDA's current good laboratory practice regulations at 21 C.F.R. Part 58 and Laws and guidance restricting the use and disclosure of personal information, including but not limited to, individually identifiable health information. No clinical trial conducted by or on behalf of Seller has been terminated or suspended prior to completion for safety or other non-business reasons. Neither Seller nor, to the knowledge of Seller, any Third Party on behalf of Seller, has received any notices (whether in writing or otherwise) or other correspondence (including any warning letter, untitled letter, 483 observations or similar notices) from the FDA, any other Regulatory Authority or any institutional review board or ethics committee (i) requiring the termination, suspension or material modification of any clinical or pre-clinical studies or tests relating to the Transferred Products, or (ii) claiming that the ownership, operation, research, development, manufacture or use of the Acquired Assets is not in compliance with all applicable Laws, and, there is no action, proceeding or suit pending or, to the knowledge of Seller, threatened in writing (including any prosecution, injunction, seizure, civil fine, suspension or recall) relating to the foregoing. Seller has informed Buyer of all serious adverse drug reactions known to Seller and its Affiliates relating to the Transferred Products or their use.

(c) Seller has not (i) made an untrue statement of a material fact or fraudulent statement to the FDA or any other Regulatory Authority, (ii) failed to disclose a material fact required to be disclosed to the FDA or any other Regulatory Authority or (iii) committed any other act, made any statement or failed to make any statement, that (in any such case) establishes a reasonable basis for the FDA to invoke its Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities Final Policy as set forth in Compliance Policy Guide Sec. 120.100, in each case, related to the Acquired Assets. As of the date of this Agreement, Seller is not the subject of any pending or threatened investigation related to the Acquired Assets by the (x) FDA pursuant to its Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities Final Policy, or (y) any other Regulatory Authority. None of Seller or any of its officers, employees, agents or clinical investigators has been suspended or debarred or convicted of any crime or engaged in any conduct that would reasonably be expected to result in (A) debarment under 21 U.S.C. § 335a or any similar Law or (B) exclusion under 42 U.S.C. § 1320a-7 or any similar Law, in each case, in connection with activities related to the Acquired Assets.

(d) Seller's Development, Manufacture, storage, distribution, import, and export of the Transferred Products is, and at all times has been, in compliance in all material respects with all applicable Laws. There has not been any replacement, "dear doctor" letter, investigator notice, safety notice, warning letter, untitled letter, inspectional observation or other written notice of action relating to an alleged lack of safety, efficacy, or regulatory compliance of the Transferred Products ("**Safety Notice**") conducted by or on behalf of Seller or, to the knowledge of Seller, any Safety Notice conducted by or on behalf of any Third Party. To the knowledge of Seller, no event has occurred or circumstance exists that (with or without notice or lapse of time) is reasonably likely to give rise to any material actual, alleged, possible or potential action to enjoin Development, Manufacture, storage, distribution, import or export of any Transferred Products. Seller has made available to Buyer copies of material complaints and notices of alleged defect or adverse reaction with respect to the Transferred Products that have been received in writing by Seller.

(e) Seller is not a party to any corporate integrity agreements, monitoring agreements, consent decrees, settlement orders, or other similar written agreements, in each case, entered into with or imposed by any Regulatory Authority and related to the Acquired Assets.

(f) Seller is, and has been, in compliance with (i) all federal, state and local fraud and abuse laws, 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.) and the regulations promulgated pursuant to such statutes; (ii) the FDCA, (iii) the Clinical Laboratory Improvement Amendments of 1988; (iv) the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information and Technology for Economic and Clinical Health Act, and the regulations promulgated pursuant thereto; (v) the PHSA and the regulations of the FDA promulgated thereunder; (vi) laws which are cause for exclusion from any federal health care program; and (vii) applicable requirements under any Permit or Laws, including applicable statutes and implementing regulations administered or enforced by the FDA or other Regulatory Authority, including provisions of the FDA's current good manufacturing practice regulations at 21 C.F.R. Parts 210-211 and those relating to investigational use, premarket approval and applications or abbreviated applications to market the Acquired Assets.

(g) All reports, documents, claims and notices required to be filed, maintained or furnished to the FDA or any other similar Regulatory Authority by Seller with respect to the Transferred Products have been so filed, maintained or furnished and were complete and correct in all material respects on the date filed (or were corrected in or supplemented by a subsequent filing), except as would not, individually or in the aggregate, reasonably be expected to materially and adversely affect the Acquired Assets, taken together as a whole.

Section 2.13 **Transferred Inventory**. The Transferred Inventory has been manufactured, handled, maintained, packaged and stored, as applicable, at all times in compliance in all material respects with applicable Law. Section 2.13 of the Seller Disclosure Letter contains a complete and accurate list of the Transferred Inventory, including the quantity of each component, and sets forth the applicable shelf life for any active ingredients, and other raw materials included in Transferred Inventory that have a shelf life.

Section 2.14 **Product Liability**. To the knowledge of Seller, there are no (i) defects in design of CTP-656 which would reasonably be expected to adversely affect performance or create a material risk of injury to persons or property or (ii) citations, decisions, adjudications or statements by any Governmental Entity or consent decrees stating that CTP-656 is defective or unsafe or fail to meet any standards promulgated by any such Governmental Entity.

Section 2.15 **Compliance with Laws**. (a) Seller is, and has been, with respect to the CF Enterprise, Acquired Assets and Assumed Liabilities, in compliance in all material respects with all applicable Laws. Seller is not a party to, nor is subject to, non-compliance proceedings or the provisions of any material Order of any Governmental Entity. No notice, citation, summons or order has been issued to Seller or any of its Affiliates, no complaint has been filed and served, no penalty has been assessed and notice thereof given, and, to the knowledge of Seller, no investigation or review is pending or, to the knowledge of Seller, threatened against Seller by any Governmental Entity with respect to any alleged, actual, possible or potential violation, or failure to comply with by Seller of any Law applicable to the CF Enterprise, Acquired Assets or Assumed Liabilities.

(b) Set forth on Section 2.15(b) of the Seller Disclosure Letter are all Permits held by Seller that are required in connection with the ownership, operation or Development of the Acquired Assets as currently owned, operated and Developed, each of which is valid and in full force and effect, and none of such Permits will lapse, terminate, expire or otherwise be impaired as a result of the execution or delivery of this Agreement or the Related Agreements by Seller or the consummation of the transactions contemplated hereby and thereby. Except for the Transferred Permits, there are no Permits, whether written or oral, necessary or required in connection with the ownership, operation or Development of the Acquired Assets as currently owned, operated and Developed. No notice, citation, summons or order has been issued, no complaint has been filed and served, no penalty has been assessed and notice thereof given, and no investigation or review is pending or, to the knowledge of Seller, threatened against Seller by any Governmental Entity with respect to any alleged, actual, possible or potential violation, failure to comply with, or failure to have, any Permit required in connection with the Acquired Assets. No event has occurred or circumstance exists that (with or without notice or lapse of time) is reasonably likely to give rise to the loss of or refusal to renew the Transferred Permits.

Section 2.16 Compliance with Anti-Bribery Laws

(a) Neither Seller nor any its Representatives or Affiliates, or any other Person acting on behalf of Seller, has:

(i) made, authorized, offered or promised to make any payment, gift or transfer of anything of value, directly, indirectly or through a third party, to or for the use or benefit of any Official for the purpose of (a) unlawfully influencing any act, decision, or failure to act by an Official in his or her official capacity; or (b) inducing such Official to use unlawfully his or her influence with any Governmental Entity to affect any act or decision of the Governmental Entity in order to obtain, retain, or direct business or secure an improper advantage, in each case related to the Acquired Assets;

(ii) made, authorized, offered or promised to make any payment, gift or transfer of anything of value, directly, indirectly or through a third party, to another individual in exchange for (or as a reward for) improper performance of a relevant function or activity related to the Acquired Assets;

(iii) requested, accepted or agreed to accept a financial or other advantage, either directly or through a third party, in exchange for (or as a reward for) improper performance of a relevant function or activity related to the Acquired Assets; or

(iv) made, authorized, offered or promised to make any unlawful bribe, rebate, payoff, influence payment or kickback or has taken any other action related to the Acquired Assets that would violate any Anti-Bribery Law binding on such Person or in effect in any jurisdiction in which such action is taken.

(b) Seller maintains books, records, and accounts that, in reasonable detail, accurately and fairly reflect in all material respects its transactions and dispositions of its assets, and maintains a system of internal accounting controls sufficient to provide reasonable assurances that:

(i) its transactions related to the Acquired Assets are executed and its funds are expended in accordance with its management's authorization;

(ii) its transactions related to the Acquired Assets are recorded as necessary to permit preparation of its financial statements in conformity with GAAP; and

(iii) access to the Acquired Assets is permitted in accordance with its management's authorization.

(c) The ownership, Development, Manufacture, Commercialization and operation of the Acquired Assets has been in compliance with all Anti-Bribery Laws to which the ownership, Development, Manufacture, Commercialization and operation of the Acquired Assets are subject, as applicable, and Seller has engaged only in lawful business practices, in each case, in all material respects.

Section 2.17 Brokers' Fees. No agent, broker, finder or investment banker other than Aquilo Partners, L.P. is entitled to any brokerage, finder's or other similar fee or commission in connection with the transactions contemplated by this Agreement based upon arrangements made by, or on behalf of, Seller. Seller is solely responsible for the fees and expenses of any such agent, broker, finder or investment banker.

Section 2.18 Sufficiency of Assets. The Acquired Assets constitute a conveyance to Buyer, free and clear of any Encumbrance, other than Permitted Encumbrances, of all of the rights, property and assets that are owned, licensed or controlled by Seller or any of its Affiliates as of the Closing Date and that are necessary or useful for the ownership, Development, Manufacture, Commercialization and operation of the CF Enterprise. None of the Excluded Assets (including those set forth in Section 1.01(b) of the Seller Disclosure Letter), other than the DCE Platform Know-How, are necessary or useful for the ownership, Development, Manufacture, Commercialization and operation of the CF Enterprise. Immediately after the Closing, no Person shall have any right, title or interest in or right to use any of the Acquired Assets, other than Buyer. Immediately after the Closing, Buyer will own all assets that are used, held for use or necessary or useful for the ownership, Development, Manufacture, Commercialization and operation of the CF Enterprise, free and clear of any Encumbrance, other than Permitted Encumbrances.

Section 2.19 Solvency. Assuming satisfaction of the conditions to this Agreement and after giving effect to the transactions contemplated hereby, the assumption or retention (as applicable) of the Excluded Liabilities by Seller and its Affiliates, payment of all amounts required to be paid in connection with the consummation of the transactions contemplated hereby, and payment of all related fees and expenses, Seller and its Affiliates (on a consolidated basis) are not insolvent as of the Closing Date and the consummation of the transactions contemplated hereby shall not render Seller insolvent. As used herein, "insolvent" means the sum of Seller's debts and other probable Liabilities exceeds the present fair saleable value of Seller's assets. Seller has no current plans to file and prosecute a petition for relief under Chapter 11 or 7 of the United States Bankruptcy Code.

Section 2.20 Board Approval. The Seller Board, by resolutions duly adopted at a meeting duly called and held and not subsequently rescinded or modified in any way (the "**Seller Board Approval**"), has (i) declared that this Agreement and the transactions contemplated hereby are advisable and in the best interests of Seller and the stockholders of Seller, (ii) approved this Agreement and the transactions contemplated hereby, (iii) recommended that the stockholders of Seller approve this Agreement and the transactions contemplated hereby and (iv) directed that this Agreement and the transactions contemplated hereunder be submitted to Seller's stockholders for their approval. No member of the Seller Board has voted against any of the foregoing.

Section 2.21 Information Supplied. The information supplied by Seller for inclusion in the Proxy Statement will not, as of the date the Proxy Statement is first mailed to the stockholders of Seller, and at the time of the Seller Special Meeting, contain any untrue statement of a material fact, or omit to state any material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. Notwithstanding the foregoing sentence, Seller makes no representation or warranty with respect to any information supplied by Buyer or any of its Representatives for inclusion in the Proxy Statement. The Proxy Statement, when filed, will comply in all material respects with the applicable requirements of the Securities Act and the Exchange Act.

Section 2.22 <u>**No Misrepresentation**</u>. To the knowledge of Seller, no representation or warranty or other statement made by Seller in this Agreement, the Seller Disclosure Letter, the certificates or documents delivered pursuant to Section 1.03(b) or otherwise in connection with the contemplated transactions contains any untrue statement or omits to state a material fact necessary to make any of them, in light of the circumstances in which it was made, not misleading. Seller does not have any knowledge of any fact related to the Acquired Assets that would reasonably be expected to materially adversely affect the assets, business, financial condition, or results of operations of the CF Enterprise that has not been set forth in this Agreement or the Seller Disclosure Letter.

Section 2.23 <u>**Disclaimer**</u>. Neither Seller nor any of its Affiliates or their respective Representatives has made, or shall be deemed to have made, any representation or warranty, express or implied, at law or in equity, in respect of Seller, the CF Enterprise, the Acquired Assets or the Assumed Liabilities, other than those expressly made by seller in this <u>Article II</u>, the certificate delivered pursuant to <u>Section 5.02(c)</u> or in one of the Related Agreements.

ARTICLE III

REPRESENTATIONS AND WARRANTIES OF BUYER

Buyer represents and warrants to Seller as of the date hereof and as of the Closing Date that:

Section 3.01 <u>**Organization**</u>. Buyer is a corporation duly organized, validly existing and in good standing under the Laws of the jurisdiction of its incorporation.

Section 3.02 <u>**Authorization of Transaction**</u>. Buyer has all requisite corporate power and authority to execute and deliver (or cause to be executed and delivered) this Agreement and each of the Related Agreements to which Buyer is (or will be as of the Closing) a party and to perform its obligations hereunder and under each of the Related Agreements to which it is (or will be as of the Closing) a party. The execution and delivery by Buyer of this Agreement and each of the Related Agreements to which it is (or will be as of the Closing) a party and the performance by Buyer of this Agreement and its obligations hereunder and thereunder, and the consummation by Buyer of the transactions contemplated hereby and thereby have been duly and validly authorized by all necessary corporate action on the part of Buyer and no other corporate or other proceedings or actions on the part of Buyer, its board of directors or stockholders are necessary therefor. This Agreement has been, and each Related Agreement to which it is (or will be at Closing) a party will be, duly and validly executed and delivered by Buyer and (assuming this Agreement and each of the Related Agreements to which Seller is (or will be at Closing) a party, constitutes the valid and binding obligation of Seller) constitutes (or will constitute) a valid and binding obligation of Buyer, enforceable against Buyer in accordance with their respective terms, except as enforceability may be limited by bankruptcy, insolvency, reorganization, fraudulent transfer, moratorium or other similar Laws relating to or affecting the rights of creditors generally and by general principles of equity.

Section 3.03 <u>**Noncontravention; Consents**</u>. Neither the execution, delivery or performance of this Agreement by Buyer or any of the Related Agreements to which Buyer is (or will be at Closing) a party, nor the consummation by Buyer of the transactions contemplated hereby or by the Related Agreements, will (with or without the giving of notice or the lapse of time, or both):

(a) conflict with or violate any provision of the charter or bylaws or other organizational documents of Buyer;

(b) require on the part of Buyer any filing with, notice to, exemption from, or any Permit, authorization, consent or approval of, any Governmental Entity with respect to the Acquired

Assets, except for (i) compliance by Buyer with the applicable requirements of the HSR Act and any other applicable Antitrust Laws, (ii) the Buyer Orphan Designation Letter, and (iii) the Buyer FDA Letter;

(c) conflict with, violate or result in a breach of, constitute a default under, result in the acceleration of, create in any party any right to accelerate, terminate, modify or cancel, require any notice, right of first offer or refusal, consent or waiver under, or result in the loss of any right or privilege under, any Contract to which Buyer is a party or by which Buyer is bound or to which any of its assets are subject, except which do not, and would not reasonably be expected to, materially and adversely affect Buyer's ability to consummate the transactions contemplated hereby; or

(d) conflict with or violate any Order or Law or other restriction of any Governmental Entity applicable to Buyer or any of its properties or assets;

except, in the case of clauses (b) through (d) of this Section 3.03, for such conflicts, breaches, defaults, consents, approvals, authorizations, declarations, filings or notices which would reasonably be expected to have a Buyer Material Adverse Effect.

Section 3.04 **Broker's Fees**. No agent, broker, finder or investment banker is entitled to any brokerage, finder's or other similar fee or commission in connection with the transactions contemplated by this Agreement based upon arrangements made by, or on behalf of, Buyer. Buyer is solely responsible for the fees and expenses of any such agent, broker, finder or investment banker.

Section 3.05 **Litigation**. There is no claim, complaint, action, suit, proceeding, hearing or investigation initiated, or, to the knowledge of Buyer, threatened, before any Governmental Entity or arbitral body against Buyer (but excluding any claim, complaint, action, suit, proceeding, hearing or investigation relating to sealed qui tam cases) which would adversely affect Buyer's performance under this Agreement or any Related Agreement or the consummation of the transactions contemplated by this Agreement or any Related Agreement. There are no outstanding Orders of any Governmental Entity or arbitral body against Buyer which would adversely affect Buyer's performance under this Agreement or any Related Agreement or the consummation of the transactions contemplated by this Agreement or any Related Agreement.

Section 3.06 **Sufficiency of Funds**. As of the date hereof, Buyer has, and at all times until the satisfaction of all of its obligations under this Agreement will have, sufficient cash, available lines of credit or other sources of immediately available funds on hand to enable it perform all of its obligations under this Agreement.

Section 3.07 **Information Supplied**. The information supplied by Buyer for inclusion in the Proxy Statement will not, as of the date the Proxy Statement is first mailed to the stockholders of Seller, and at the time of the Seller Special Meeting, contain any untrue statement of a material fact, or omit to state any material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. Notwithstanding the foregoing sentence, Buyer makes no representation or warranty with respect to any information supplied by Seller or any of its Representatives for inclusion in the Proxy Statement. The information supplied by Buyer for inclusion in the Proxy Statement will comply in all material respects with the applicable requirements of the Securities Act and the Exchange Act.

Section 3.08 **Solvency.** Assuming satisfaction of the conditions to this Agreement and after giving effect to the transactions contemplated hereby, the assumption or retention (as applicable) of the Assumed Liabilities by Buyer, payment of all amounts required to be paid in connection with the consummation of the transactions contemplated hereby, and payment of all related fees and expenses, neither the Buyer nor the Guarantor will be insolvent as of the Closing Date and the consummation of the transactions contemplated by this Agreement and the Related Agreements shall not render Buyer or the Guarantor insolvent. As used herein, "insolvent" means the sum of the debts and other probable Liabilities of the Buyer exceeds the present fair saleable value of the assets of the Buyer. Neither Buyer nor the Guarantor has current plans to file and prosecute a petition for relief under Chapter 11 or 7 of the United States Bankruptcy Code or any similar foreign Laws.

Section 3.09 **Limited Representations**. Buyer acknowledges, for itself and on behalf of its Affiliates, that none of Seller, its Affiliates or their respective Representatives or any other Person acting on their behalf has made any representation or warranty regarding the CF Enterprise, the Acquired Assets, the Assumed Liabilities or the transactions contemplated by this Agreement, except as expressly set forth in Article II, the certificate delivered pursuant to Section 5.02(c) or in one of the Related Agreements. Buyer acknowledges that, to the extent provided by Seller, none of Seller, its Affiliates or their respective Representatives thereof makes any representation or warranty with respect to any estimates, projections, forecasts or business plans (including the reasonableness of the assumptions underlying such estimates, projections, forecasts or plans).

ARTICLE IV

PRE-CLOSING COVENANTS

Section 4.01 **Operation of Business**.

(a) Except as otherwise consented to in writing by Buyer, as set forth on Section 4.01 of the Seller Disclosure Letter, the Research and Testing Agreement or as required by applicable Law or Order, or as expressly contemplated by this Agreement, during the period from the date of this Agreement until the Closing Date or the date, if any, on which this Agreement is earlier validly terminated pursuant to Section 7.01 (the "**Pre-Closing Period**"), Seller shall:

(i) use commercially reasonable efforts to preserve the CF Enterprise and operate the Acquired Assets in the Ordinary Course; and

(ii) not materially deviate from the planned re-stocking of Transferred Inventory summarized on Section 4.01(a)(ii) of the Seller Disclosure Letter unless such material deviation is the result of a circumstance outside of Seller's control and to which Seller did not contribute. Seller shall promptly notify Buyer once it becomes aware of any actual or expected material deviation.

(b) Except (1) as set forth on Section 4.01(b) of the Seller Disclosure Letter or as required by this Agreement, (2) as required by applicable Law or Order, or (3) with the written consent of Buyer, such consent not to unreasonably be withheld, conditioned or delayed, Seller shall not:

(i) sell, lease, abandon or otherwise dispose of or permit any Encumbrance (other than Permitted Encumbrances) on any Acquired Asset, except inventory in the Ordinary Course;

(ii) acquire any properties or assets that constitute Acquired Assets, either tangible or intangible, other than in the Ordinary Course;

(iii) (A) settle or commence any claim, complaint, action, suit, proceeding, hearing or investigation; or (B) waive any claims or rights, in either case in a manner that would constitute an Assumed Liability or with respect to the Acquired Assets, except, after reasonable consultation with Buyer, claims or rights relating to any Transaction

Litigation that would not reasonably be expected to impair or adversely affect the Acquired Assets;

(iv) fail to pay in the Ordinary Course all payables and other Liabilities, in each case, that would constitute Assumed Liabilities, when due;

(v) (A) enter into, extend, modify, amend, terminate or renew or waive any right or remedy under any Assigned Contract (or any Contract that would be an Assigned Contract if entered into prior to the date hereof) or (B) knowingly take, or fail to take, any action that would constitute a breach, violate the terms, conditions or provisions of, or result in a default under, or give to others any rights of termination, amendment, acceleration or cancellation of any Assigned Contract;

(vi) except as otherwise expressly permitted or required under this Agreement, terminate or materially modify any ongoing clinical trial with respect to the Transferred Products;

(vii) take any action which would reasonably be likely to impair Buyer's rights in the Acquired Assets;

(viii) fail to maintain material insurance policies currently maintained by or on behalf of Seller or covering the Acquired Assets or the Assumed Liabilities unless comparable replacement policies with substantially similar coverage areas and amounts are procured;

(ix) fail to comply with all Laws applicable to the Acquired Assets and the Assumed Liabilities in all material respects;

(x) terminate or fail to maintain or renew any Transferred Permits;

(xi) dispose of or permit to lapse any Transferred IP; or

(xii) enter into any agreement, or otherwise become obligated, to do any action prohibited under clauses (i) – (xi) of this Section 4.01(b).

Section 4.02 Access. During the Pre-Closing Period, Seller shall keep Buyer informed of all material developments relevant to the ownership, Development, Manufacture, Commercialization and operation of the Acquired Assets and its ability to consummate the transactions contemplated hereby, including with respect to the items set forth on Section 4.02 of the Seller Disclosure Letter. During the Pre-Closing Period, subject to (a) compliance with applicable Laws and (b) any established legal privilege, Seller shall permit (or cause to be permitted) the Representatives of Buyer, at Buyer's expense, to have reasonable access (at reasonable times, on reasonable prior written notice and in a manner so as not to unreasonably disrupt the normal business operations of Seller or its Affiliates) to the premises, properties, financial and accounting records, employees, Contracts, and other records and documents, of or pertaining to the CF Enterprise, the Acquired Assets and the Assumed Liabilities, and such other relevant information and materials as may be reasonably requested. Buyer acknowledges that it remains bound by the amended and restated mutual confidentiality agreement, dated August 5, 2016, entered into between Buyer and Seller (the "**Confidentiality Agreement**"), provided that Buyer shall be authorized to engage in discussions with, and disclose confidential information (as defined in the Confidentiality Agreement) to, (i) Regulatory Authorities in connection with its post-closing integration planning and (ii) such other third-parties as may be required in connection with the conduct of activities under the Research and Testing Agreement. Prior to the Closing, except as contemplated by the Research and Testing Agreement, Buyer shall not, and shall cause each member of the Buyer Group and their respective

Representatives not to, contact or communicate with the employees, customers and suppliers of Seller or any of their respective Affiliates in connection with the transactions contemplated by this Agreement without the prior written consent of Seller.

Section 4.03 **Governmental Approvals and Consents**.

(a) Subject to the terms and conditions of this Agreement (including Section 4.03(f)), each Party will use commercially reasonable efforts to take, or cause to be taken, all actions and to do, or cause to be done, all things necessary, proper or advisable under this Agreement and applicable Laws to satisfy the conditions to Closing set forth herein and consummate the transactions contemplated hereby as soon as practicable after the date of this Agreement and in any event no later than the Outside Date, including (x) preparing and filing, in consultation with the other Party and as promptly as practicable and advisable after the date of this Agreement, all documentation (A) to effect all necessary applications, notices, petitions and other filings and (B) to obtain all waiting period expirations or terminations, registrations, permits and authorizations necessary or advisable to be obtained from any Governmental Entity in order to consummate the transactions contemplated hereby and (y) taking all steps as may be necessary to obtain all waiting period expirations or terminations, registrations, permits and authorizations, including defending or contesting any suit, action, legal proceeding or claim brought by a Third Party, including any Governmental Entities, that would otherwise prevent or materially impede, interfere with, hinder or delay the consummation of the transactions contemplated hereby. In furtherance and not in limitation of the foregoing, each Party agrees (i) to make all necessary applications, notices, petitions and filings required (and thereafter make any other required submissions and respond as promptly as practicable to any requests for additional information or documentary material) with respect to this Agreement or the transactions contemplated hereby with the Antitrust Division of the Department of Justice (the "**DOJ**") and the Federal Trade Commission (the "**FTC**") on a Notification and Report Form pursuant to the HSR Act with respect to the transactions contemplated hereby as promptly as practicable, and in any event within ten (10) Business Days after the execution of this Agreement (unless another date is mutually agreed between the Parties), and any other Governmental Entity under any other applicable Antitrust Law and (ii) to promptly determine whether any other filings are required to be made with, and whether any other consents, approvals, Permits or authorizations are required to be obtained from, any Governmental Entity under any other applicable Law in connection with the transactions contemplated hereby, and if so, to promptly prepare and file any such filings and to seek any such other consents, approvals, permits or authorizations (the filings described in the foregoing clauses (i) and (ii) collectively, "**Regulatory Filings**"). All filing fees required in connection with the Regulatory Filings shall be borne by Buyer.

(b) In connection with, and without limiting, the efforts or the obligations of the Parties under Section 4.03(a) but subject to Section 4.03(f), each of Buyer and Seller shall, to the extent permitted by applicable Law and not prohibited by the applicable Governmental Entity, (i) cooperate and coordinate in all respects with the other in the making of Regulatory Filings (including, to the extent permitted by applicable Law, providing copies, or portions thereof, of all such documents to the non-filing Parties prior to filing and considering all reasonable additions, deletions or changes suggested by the non-filing Parties in connection therewith) and in connection with resolving any investigation, request or other inquiry of any Governmental Entity under any applicable Law with respect to any such filing, (ii) supply the other Party and its counsel, as applicable, with any information and reasonable assistance that may be required or reasonably requested in connection with the making of such filings, including, within the time allowed by the relevant Governmental Entity and under applicable Law, any additional or supplemental information that may be required or reasonably requested by the FTC, the DOJ and the relevant Governmental Entities in any applicable jurisdiction in which any such filing is made under any other applicable Law and (iii) use commercially reasonable efforts to take, or cause to be taken, all actions and to do, or cause to be done, and to assist and cooperate with the other Parties in doing, all things necessary, proper or advisable to obtain the expiration or termination of the applicable waiting periods (and any extension thereof) under the HSR Act or any other Antitrust Law (the "**Antitrust Approvals**"), in each case as soon as practicable, and to avoid any impediment to the consummation of the transactions contemplated hereby under any applicable Law, including using commercially reasonable efforts to take all such action as reasonably may be necessary to resolve such objections, if any, as the FTC, the DOJ or any other Governmental Entity or Person may assert with respect to the transactions contemplated hereby. Notwithstanding anything to the contrary in this Section 4.03(b), none of Buyer, on the one hand, or Seller, on the other hand, shall be required to agree to any term or take or refrain from taking any action in connection with obtaining the Antitrust Approvals that is not conditioned upon the consummation of the transactions contemplated hereby.

(c) Each of Buyer, on the one hand, and Seller, on the other hand, shall, to the extent practicable and unless prohibited by applicable Law or by the applicable Governmental Entity, promptly inform the other of any material communication from any Governmental Entity regarding any of the transactions contemplated hereby in connection with any Regulatory Filings or investigations with, by or before any Governmental Entity relating to this Agreement or the transactions contemplated hereby, including any claims, complaints, actions, suits, proceedings, hearings or investigations initiated by a private party. If any Party or affiliate thereof shall receive a request for additional information or documentary material from any Governmental Entity with respect to a Regulatory Filing, then such Party shall, subject to Section 4.03(f), use its commercially reasonable efforts to make, or cause to be made, as soon as reasonably practicable, an appropriate response in compliance with such request. In connection with and without limiting the foregoing, to the extent reasonably practicable and unless prohibited by applicable Law or by the applicable Governmental Entity, the Parties will (i) give each other reasonable advance notice of all meetings with any Governmental Entity relating to the transactions contemplated hereby, (ii) give each other an opportunity to participate in each of such meetings, (iii) keep the other Party reasonably apprised with respect to any material communications with any Governmental Entity regarding the transactions contemplated hereby, (iv) cooperate in the filing of any analyses, presentations, memoranda, briefs, arguments, opinions or other written communications explaining or defending the transactions contemplated hereby, articulating any regulatory or competitive argument or responding to requests or objections made by any Governmental Entity, (v) provide each other with a reasonable advance opportunity to review and comment upon, and consider in good faith the views of the other with respect to, all material written communications (including applications, analyses, presentations, memoranda, briefs, arguments and opinions) with a Governmental Entity regarding the transactions contemplated hereby and (vi) provide each other (or counsel of each Party, as appropriate) with copies of all material written communications to or from any Governmental Entity relating to the transactions contemplated hereby. Any such disclosures, rights to participate or provisions of information by one Party to the other may be made on a counsel-only basis to the extent required under applicable Law. It is acknowledged and agreed that, subject to the provisions of this Section 4.03(c) and except where prohibited by applicable Law, Buyer shall have sole responsibility for determining strategy with respect to the Antitrust Approvals.

(d) Buyer will not extend any waiting period under the HSR Act (by pull and refile, or otherwise) or any other Antitrust Laws or enter into any agreement with the FTC, the DOJ or any other Governmental Entity not to consummate the transactions contemplated hereby, except with the prior written consent of Seller. Neither Buyer nor Seller shall, nor shall they permit their respective Subsidiaries to, acquire or agree to acquire any business, Person or division thereof, or otherwise acquire or agree to acquire any assets, if the entering into of a definitive agreement relating to, or the consummation of, such acquisition could reasonably be expected to increase the risk of not obtaining the applicable consent, clearance, approval, authorization or waiver under the HSR Act or any Antitrust Law with respect to the transactions contemplated hereby.

(e) Subject to Section 4.03(f), each of Buyer and Seller shall use its commercially reasonable efforts to obtain all of its respective consents, waivers, authorizations and approvals of all Third Parties (other than Governmental Entities, which are the subject of clauses (a)-(d) above) necessary, proper or advisable for the consummation of the transactions contemplated hereby and to provide any notices to Third Parties required to be provided by it prior to the Closing.

(f) Nothing contained in this Section 4.03 or in any other provision of this Agreement shall be construed as requiring Buyer to agree to any terms or conditions as a condition to, or in connection with, obtaining any Antitrust Approval that would (i) impose any limitations on Buyer's ownership or operation of all or any portion of the Acquired Assets or all or any portion of its or its Subsidiaries', businesses or assets, or compel Buyer or any of its Subsidiaries to dispose of or hold separate all or any portion of the Acquired Assets or any portion of its or its Subsidiaries', businesses or assets, (ii) impose any limitations on the ability of Buyer to acquire or hold or to exercise full rights of ownership of the Acquired Assets, (iii) impose any obligations on Buyer or any of its Subsidiaries in respect of or relating to Buyer's or any of its Subsidiaries' facilities, operations, places of business, employment levels, products or businesses, (iv) require Buyer or any of its Subsidiaries to make any payments or (v) impose any other obligation, restriction, limitation, qualification or other condition on Buyer or any of its Subsidiaries (other than, with respect to clauses (iii), (iv) and (v), such terms or conditions as are reasonable and relate to the Ordinary Course and that are imposed by a Governmental Entity with power and authority to grant the Antitrust Approvals, and which, individually or in the aggregate, do not competitively disadvantage Buyer or any of its Subsidiaries) (any such term or condition in (i) through (v) being referred to herein as a "**Burdensome Term or Condition**").

(g) Notwithstanding anything herein to the contrary, in no event shall Seller or any of its Subsidiaries agree to any obligation, restriction, requirement, limitation, qualification, condition, remedy or other action relating to the Antitrust Approvals without the prior written consent of Buyer; provided, that notwithstanding the foregoing (i) it is understood and agreed that any failure by Seller to agree to any such obligation, restriction, requirement, limitation, qualification, condition, remedy or other action by reason of Buyer's withholding its written consent from Seller to do so shall not constitute a breach of this Section 4.03 by Seller and (ii) Buyer shall be required to provide its written consent to Seller agreeing to any such obligation, restriction, requirement, limitation, qualification, condition, remedy or other action to the extent it would not, individually, or together with any other such obligation, restriction, requirement, limitation, qualification, condition, remedy or other action, impose a Burdensome Term or Condition.

Section 4.04 Notices of Certain Events. During the Pre-Closing Period, Seller and Buyer shall promptly notify the other Party of any of the following after gaining knowledge thereof:

(a) any material actions, suits, claims or proceedings in connection with the transactions contemplated by this Agreement commenced or threatened against Seller relating to the Acquired Assets or the Assumed Liabilities, or Buyer, as the case may be;

(b) the occurrence or non-occurrence of any fact or event which would be reasonably likely to cause any condition set forth in Article V of this Agreement not to be satisfied;

(c) the occurrence or existence of any fact, circumstance or event which could result in any representation or warranty made by Seller in this Agreement or any exhibit, schedule or certificate or delivered herewith, to be untrue or inaccurate in any material respect;

(d) any notice or other communication from any Person alleging that the consent of such Person is or may be required in connection with the transactions contemplated by this Agreement;

(e) any oral or written communication Seller receives from any Governmental Entity with respect to the Acquired Assets, the Assumed Liabilities or the transactions contemplated hereby;

(f) the occurrence of any event, circumstance, development, state of facts, occurrence, change or Effect which has had a Seller Material Adverse Effect or the occurrence or non-occurrence of any event, circumstance, development, state of facts, occurrence, change or effect which would reasonably be expected, individually or in the aggregate to result in a Seller Material Adverse Effect; and

(g) any filings, payments or similar actions that must be taken within 120 days of the Closing Date for the purposes of obtaining, maintaining, perfecting or renewing registration of Registered IP.

If Seller provides a notification pursuant to this Section 4.04(a), (b), (c), (f) and (g) prior to the Closing, Seller shall also, by notice in accordance with the terms of this Agreement, supplement or amend the Seller Disclosure Letter (each, a "**Supplement**"), in order to correct any matter that first arises after the date hereof which may constitute a breach of any representation, warranty, agreement or covenant contained herein. If Buyer does not provide a written termination notice pursuant to Section 7.01(h) within five (5) Business Days after the expiration of the thirty (30) day cure period set forth in Section 7.01(b), Buyer shall be deemed to have waived its rights (i) to terminate this Agreement pursuant to Section 7.01(b) and (ii) to seek indemnification from Seller in accordance with Section 6.02, in each case, solely with respect to the subject matter of such Supplement.

Section 4.05 **Release of Encumbrances**. Seller shall take all actions required of Seller to cause any Encumbrance, other than Permitted Encumbrances, on the Acquired Assets to be terminated and released as of the Closing. For the avoidance of doubt, nothing in this Section 4.05 modifies Seller's obligation to deliver the Acquired Assets free and clear of all Encumbrances, other than Permitted Encumbrances.

Section 4.06 **No Solicitation by Seller; Seller Board Recommendation**.

(a) During the Pre-Closing Period, Seller shall not, and shall cause its Subsidiaries and their respective Representatives not to, directly or indirectly, solicit, initiate, knowingly encourage or knowingly facilitate, or furnish or disclose non-public information in furtherance of, any inquiries that would reasonably be expected to lead to, or the making of any proposal or offer to implement, any Alternative Transaction, or negotiate or otherwise engage in discussions with any Person (other than Buyer or its Representatives) with respect to any Alternative Transaction, or approve, recommend or authorize any Alternative Transaction, or enter into any agreement, arrangement or understanding with respect to any Alternative Transaction or requiring it to abandon, terminate or fail to consummate the sale of the Acquired Assets in accordance with the terms hereof; provided, that at any time prior to receipt of the Seller Stockholder Approval (and in no event after receipt of the Seller Stockholder Approval), Seller may furnish information or afford access to, and negotiate or otherwise engage in discussions with, any Third Party who delivers a bona fide written proposal for an Alternative Transaction that was not solicited after the date of this Agreement or in violation of this Section 4.06, if and so long as the Seller Board determines in good faith after consultation with its outside legal counsel that failure to take such action would be reasonably likely to be inconsistent with the Seller Board's fiduciary duties under Delaware Law and determines in good faith that such a proposal is, or would reasonably be expected to lead to, a Superior Proposal.

(b) During the Pre-Closing Period, Seller shall notify Buyer promptly (but in any event within 24 hours) of any inquiries, proposals or offers received by, or any discussions or negotiations sought to be initiated or continued with, Seller or any of its Representatives, in each case relating to an

Alternative Transaction, indicating the name of such Person and providing to Buyer a summary of the material terms of such proposal or offer for an Alternative Transaction. Prior to providing any information or data to, or entering into any negotiations or discussions with, any Person in connection with a proposal or offer for an Alternative Transaction, Seller shall receive from such Person an executed confidentiality agreement containing confidentiality terms and provisions at least as restrictive as those contained in the Confidentiality Agreement (which shall not preclude discussions or negotiations relating to the proposal or offer from such Person and which shall not contain any exclusivity provision or other term that would restrict, in any manner, Seller's ability to consummate the transactions contemplated by this Agreement). Seller agrees that it will keep Buyer reasonably informed, on a reasonably prompt basis, of the status and material terms of any such proposals or offers (including any material developments) in respect of any such discussions or negotiations and that it will deliver to Buyer a summary of any material changes to any such proposals or offers and all nonpublic information being furnished to such Person not previously provided to Buyer.

(c) Seller agrees that it will immediately cease and cause to be terminated any existing activities, discussions or negotiations with any Third Parties conducted prior to the date of this Agreement with respect to any Alternative Transaction (and promptly terminate all physical and electronic data room access previously granted to any such Third Party) and will not terminate, amend, modify or waive any provision of any confidentiality or standstill agreement to which it is a party and shall enforce, to the fullest extent permitted under applicable Law, the provisions of any such agreement.

(d) Notwithstanding anything in this Section 4.06 or Section 4.07 to the contrary, at any time prior to the receipt of the Seller Stockholder Approval (and in no event after the receipt of the Seller Stockholder Approval), the Seller Board may (i) effect a Seller Change of Recommendation in response to a Seller Intervening Event or (ii) effect a Seller Change of Recommendation and, subject to compliance with this Section 4.06 and Section 7.01(g), terminate this Agreement in accordance with Section 7.01(g), following receipt of an unsolicited bona fide written proposal for an Alternative Transaction after the date of this Agreement, which the Seller Board determines in good faith by resolution duly adopted after consultation with its outside legal counsel is a Superior Proposal, in each case with respect to clauses (i) and (ii), if and only if the Seller Board determines in good faith after consultation with its outside legal counsel that such action would be reasonably likely to be inconsistent with the Seller Board's fiduciary duties under Delaware Law and Seller has complied in all material respects with the applicable provisions of this Section 4.06 with respect thereto. Prior to effecting a Seller Change of Recommendation or Seller Change of Recommendation and termination of this Agreement in accordance with Section 7.01(g) as provided above, Seller shall provide Buyer with five (5) Business Days' prior written notice (it being understood and agreed that any amendment to the financial terms or any other material term of such applicable Alternative Transaction or any change to the material facts or circumstances relating to such Seller Intervening Event shall, in each case, require a new written notice and a new three (3) Business Day period commencing at the time of such new notice) advising Buyer of Seller's intention to effect a Seller Change of Recommendation or Seller Change of Recommendation and termination of this Agreement in accordance with Section 7.01(g) as provided above, and specifying in reasonable detail (i) in the case of an Alternative Transaction, the material terms and conditions of, and the identity of any Person proposing, such Alternative Transaction or (ii) in the case of a Seller Intervening Event, the material facts and circumstances relating to such Seller Intervening Event, and that Seller shall, during such time and if requested by Buyer, engage in good faith negotiations with Buyer (including by making its officers and its legal advisors reasonably available to negotiate) to amend this Agreement (x) such that the proposed Alternative Transaction would no longer constitute a Superior Proposal or (y) in a manner that obviates the need to effect a Seller Change of Recommendation, as applicable. The Parties agree that nothing in this Section 4.06 shall in any way limit or otherwise affect Buyer's right to terminate this Agreement pursuant to Section 7.01(d) at such time as the requirements of such subsection have been met. Any such Seller Change of Recommendation shall not change the approval of this Agreement or any other approval of the Seller Board in any respect that would have the effect of causing any state corporate takeover statute or other similar statute to be applicable to the transactions contemplated hereby. Notwithstanding any Seller Change of Recommendation, if this Agreement is not otherwise terminated by either Party in accordance with the terms hereof, this Agreement shall be submitted to the stockholders of Seller at the Seller Special Meeting for the purpose of voting on the authorization of this Agreement and the transactions consummated hereby, and nothing contained herein, including any rights of Seller to take certain actions pursuant to Section 4.06, shall be deemed to relieve Seller of such obligation. Nothing contained in this Agreement shall prohibit Seller from (A) complying with Rule 14a-9, Rule 14d-9 and Rule 14e-2(a) promulgated under the Exchange Act; provided, that any such action made that relates to an Alternative Transaction shall be deemed to be a Seller Change of Recommendation unless the Seller Board recommends against the Alternative Transaction and reaffirms the Seller Board Recommendation in connection with such action, (B) making any disclosure to the stockholders of Seller if the Seller Board determines in good faith, after consultation with its outside legal counsel, that failure to take such action would be reasonably likely to be inconsistent with the Seller Board's fiduciary duties under Delaware Law or (C) informing any Person of the existence of the provisions contained in this Section 4.06; provided, however, that neither the Seller Board nor any committee thereof shall, except as expressly permitted by this Section 4.06(d), effect any Seller Change of Recommendation, it being understood that a "stop, look and listen" communication to the stockholders of Seller pursuant to Rule 14d-9(f) under the Exchange Act (or any similar communication to the stockholders of Seller) shall not be deemed to be or constitute a Seller Change of Recommendation.

Section 4.07 Preparation of the Proxy Statement; Seller Stockholders' Meeting.

(a) As promptly as reasonably practicable following the date of this Agreement (but in any event, no more than twenty (20) days following the date of this Agreement), Seller shall prepare and cause to be filed with the SEC the Proxy Statement in preliminary form, in such form and substance as Seller shall determine and providing Buyer with an opportunity to review (and Seller will give reasonable and due consideration to all comments by Buyer) and in compliance as to form in all material respects with the applicable provisions of the Securities Act and the rules and regulations thereunder. Each of Seller and Buyer shall furnish all information concerning itself, its Affiliates and the holders of its Common Stock to the other and provide such other assistance as may be reasonably requested by such other Party in connection with the preparation, filing and distribution of the Proxy Statement. Seller shall promptly notify Buyer upon the receipt of any comments from the SEC or any request from the SEC for amendments or supplements to the Proxy Statement, and shall, as promptly as reasonably practicable after receipt thereof, provide Buyer with copies of all correspondence related to the Proxy Statement between it and its Representatives, on one hand, and the SEC, on the other hand, and all written comments with respect to the Proxy Statement received from the SEC, and advise Buyer of any oral comments with respect to the Proxy Statement received from the SEC. Seller shall respond as promptly as reasonably practicable to any comments from the SEC with respect to the Proxy Statement. Notwithstanding the foregoing, no filing of any amendment or supplement to the Proxy Statement or response to any comments of the SEC with respect to the Proxy Statement or any amendment or supplement thereof shall be made by Seller without providing Buyer with an opportunity to review (and Seller will give reasonable and due consideration to all comments by Buyer), except to the extent such amendment, supplement or response are made in connection with an Alternative Transaction as permitted by Section 4.06.

(b) Without limiting the generality of the foregoing, the information supplied or to be supplied by either Party for inclusion or incorporation by reference in the Proxy Statement shall not, on the date the Proxy Statement (or any amendment thereof or supplement thereto) is first mailed to stockholders of Seller, at the time of the Seller Special Meeting, or as of the Closing Date, contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. If, at any time prior to the Closing Date, any information relating to Seller or Buyer, or any of their respective Affiliates, should be discovered by Seller or Buyer that, in the reasonable judgment of Seller or Buyer, should be set forth in an amendment of, or a supplement to, the Proxy Statement, so that the Proxy Statement would not include any misstatement of a material fact or omit to state any material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, the Party that discovers such information shall promptly notify the other Party, and Seller and Buyer shall cooperate in the prompt filing with the SEC of any necessary amendment of, or supplement to, the Proxy Statement and, to the extent required by Law, in disseminating the information contained in such amendment or supplement to stockholders of Seller. Nothing in this Section 4.07(b) shall limit the obligations of any Party under Section 4.07(a). For purposes of this Section 4.07, any information concerning or related to Seller or its Affiliates or their respective Representatives will be deemed to have been provided by Seller, and any information concerning or related to Buyer or its Affiliates or their respective Representatives will be deemed to have been provided by Buyer.

(c) Subject to the provisions of Section 4.06, Seller shall, in accordance with applicable Law and Seller's charter and bylaws, establish a record date for, duly call, give notice of, convene and hold the Seller Special Meeting as promptly as reasonably practicable after the date hereof, for the purpose of obtaining the Seller Stockholder Approval; provided, that the Seller Special Meeting shall occur no more than thirty (30) Business Days after the date that the SEC has advised that it will not provide further comments on the Proxy Statement (or the date on which the ten-day period referred to in Rule 14a-6 under the Exchange Act has expired without receipt of SEC comments or notice from the SEC that it will provide comments). Subject to the provisions of Section 4.06 and compliance with applicable Law, Seller shall, as promptly as reasonably practicable on or after the date that the SEC has advised that it will not provide further comments on the Proxy Statement (or the date on which the ten-day period referred to in Rule 14a-6 under the Exchange Act has expired without receipt of SEC comments or notice from the SEC that it will provide comments) (but it any event no more than five (5) Business Days thereafter), mail the Proxy Statement to the stockholders of Seller. Subject to the provisions of Section 4.06, Seller (i) shall include in the Proxy Statement the Seller Board Recommendation, (ii) shall use its reasonable best efforts to solicit and obtain the Seller Stockholder Approval, and (iii) shall not withhold, withdraw, amend, modify or qualify (or publicly propose to or publicly state that it intends to withdraw, amend, modify or qualify) in any manner adverse to Buyer the Seller Board Recommendation (it being understood that publicly taking a neutral position or no position with respect to an Alternative Transaction (other than a "stop, look and listen" communication to the stockholders of Seller pursuant to Rule 14d-9(f) under the Exchange Act (or any similar communication to the stockholders of Seller) shall be considered a modification to the Seller Board Recommendation in a manner adverse to Buyer) (collectively, a "**Seller Change of Recommendation**"), except to the extent permitted by Section 4.06. Notwithstanding the foregoing provisions of this Section 4.07(c), Seller shall be permitted to recess, adjourn, postpone or delay the Seller Special Meeting without the prior consent of Buyer if and solely to the extent that: (i) there are holders of an insufficient number of Common Stock present or represented by a proxy at the Seller Special Meeting to constitute a quorum at the Seller Special Meeting, provided, that any such recesses, adjournments, postponements or delays shall not cause the Seller Special Meeting to be recessed, adjourned, postponed or delayed by more than fifteen (15) days after the initial date established for the Seller Special Meeting; (ii) Seller has not received proxies representing a sufficient number of Common Stock to obtain the Seller Stockholder Approval, provided, that any such adjournments, postponements or delays shall not cause the Seller Special Meeting to be adjourned, postponed or delayed by more than more than fifteen (15) days after the initial date established for the Seller Special Meeting; (iii) such adjournment, postponement, delay or cancellation is required by applicable Law or a request from the SEC or its staff; or (iv) in the good faith judgment of the Seller Board (after consultation with its outside legal advisors), the failure to adjourn, postpone or delay the

Seller Special Meeting would be reasonably likely to not allow sufficient time under applicable Laws for the distribution and review of any required or appropriate supplement or amendment to the Proxy Statement by Seller's stockholders prior to the Seller Special Meeting as then-scheduled.

ARTICLE V

CONDITIONS PRECEDENT TO CLOSING

Section 5.01 **Conditions to the Obligations of Each Party**. The respective obligations of Buyer and Seller to consummate the transactions contemplated hereby are subject to the satisfaction or waiver (if permissible under applicable Law) by Buyer or Seller, as appropriate, at or before the Closing Date, of each of the following conditions:

(a) the Seller Stockholder Approval shall have been obtained;

(b) no Order, stipulation or injunction by any Governmental Entity of competent jurisdiction shall be in effect which prevents, makes illegal, or limits the consummation of any of the transactions contemplated by this Agreement, and no action, suit or proceeding shall be pending by or before any Governmental Entity of competent jurisdiction seeking an Order, stipulation or injunction seeking to enjoin, restrain or otherwise prevent or prohibit the consummation of, or limit, any of the transactions contemplated by this Agreement;

(c) no Law shall have been enacted, promulgated or deemed applicable to the transactions contemplated hereby by any Governmental Entity that prevents the consummation of such transactions or has the effect of making such consummation thereof illegal or otherwise prohibiting, restraining or enjoining the consummation of such transactions;

(d) all waiting periods under the HSR Act and any other applicable Antitrust Laws (and any extensions thereof) shall have been terminated or shall have expired; and

(e) the Escrow Agreement shall have been duly executed and delivered by the Escrow Agent.

Section 5.02 **Conditions to Obligations of Buyer**. In addition to the satisfaction or waiver, as applicable, of the conditions under Section 5.01, the obligation of Buyer to consummate the transactions to be consummated at the Closing is subject to the satisfaction (or waiver (if permissible under applicable Law) in writing by Buyer) of the following conditions:

(a) (i) each of the Fundamental Representations of Seller set forth in Article II shall be true and correct (disregarding all qualifications and exceptions as to materiality or Seller Material Adverse Effect contained therein) in all material respects on and as of the date of this Agreement and on and as of the Closing Date (except with respect to representations and warranties that address matters only as of a particular date, in which case, as of such other date); and (ii) each of the representations and warranties of Seller set forth in Article II (other than the Fundamental Representations) shall be true and correct (disregarding all qualifications and exceptions as to materiality or Seller Material Adverse Effect contained therein) on and as of the date of this Agreement and on and as of the Closing Date (except with respect to representations and warranties that address matters only as of a particular date, in which case, as of such other date), except for failures of such representations and warranties to be true and correct as to matters that would not reasonably be expected to have a Seller Material Adverse Effect;

(b) Seller shall have performed or complied in all material respects with the agreements and covenants required to be performed or complied with by it under this Agreement at or prior to the Closing;

(c) Seller shall have delivered to Buyer a certificate, validly executed by a duly authorized officer of Seller, dated as of the Closing Date, certifying that each of the conditions specified in clauses (a), (b) and (h) of this Section 5.02 is satisfied;

(d) Seller shall have delivered a certificate of non-foreign status satisfying the requirements of Treasury Regulation Section 1.1445-2(b) in a form reasonably acceptable to Buyer;

(e) Seller shall have delivered to Buyer all other items listed in Section 1.03(b) not otherwise delivered under this Section 5.02;

(f) Seller shall have delivered to Buyer letters from Seller to the FDA transferring to Buyer or any of its designees ownership of (i) Investigational New Drug Application # 12855 (and any additional applications with the FDA) in substantially the form attached hereto as Exhibit E-1 (the "**Seller FDA Letter**") and (ii) the orphan drug designation of CTP-656 in substantially the form attached hereto as Exhibit E-2 (the "**Seller Orphan Designation Letter**");

(g) Seller shall have delivered a counterpart to the Escrow Agreement, duly executed by Seller;

(h) All Third Party consents and notices set forth on Section 5.02(h) of the Seller Disclosure Letter shall have been obtained or delivered, as applicable, in form and substance reasonably satisfactory to Buyer;

(i) Since the date of this Agreement, there shall not have occurred a Seller Material Adverse Effect;

(j) No Antitrust Approval shall, individually or in the aggregate, impose any Burdensome Term or Condition; and

(k) Seller shall have in its inventory, a minimum quantity of Transferred Inventory with respect to CTP-656 Free Base equal to forty (40) kilograms.

Section 5.03 Conditions to Obligations of Seller. The obligation of Seller to consummate (or cause to be consummated) the transactions to be consummated at the Closing are subject to the satisfaction (or waiver in writing by Seller) of the following conditions:

(a) (i) each of the Fundamental Representations of Buyer set forth in Article III shall be true and correct (disregarding all qualifications and exceptions as to materiality or Buyer Material Adverse Effect contained therein) in all material respects on and as of the date of this Agreement and on and as of the Closing Date (except with respect to representations and warranties that address matters only as of a particular date, in which case, as of such other date); and (ii) each of the representations and warranties of Buyer set forth in Article III (other than the Fundamental Representations) shall be true and correct (disregarding all qualifications and exceptions as to materiality or Buyer Material Adverse Effect contained therein) on and as of the date of this Agreement and on and as of the Closing Date (except with respect to representations and warranties that address matters only as of a particular date, in which case, as of such other date), except for failures of such representations and warranties to be true and correct as to matters that would not reasonably be expected to have a Buyer Material Adverse Effect;

(b) Buyer shall have performed or complied with in all material respects its agreements and covenants required to be performed or complied with by it under this Agreement at or prior to the Closing;

(c) Buyer shall have delivered to Seller a certificate, validly executed by a duly authorized officer of Buyer, dated as of the Closing Date, certifying that each of the conditions specified in clauses (a) and (b) of this Section 5.03 is satisfied;

(d) Buyer shall have delivered a counterpart to the Escrow Agreement, duly executed by Buyer;

(e) Buyer shall have delivered to Seller letters from Buyer or any of its designees to the FDA accepting ownership of (i) Investigational New Drug Application # 12855 (and any additional applications with the FDA) issued by the FDA in substantially the form attached hereto as Exhibit F-1 (the "**Buyer FDA Letter**") and (ii) the orphan drug designation of CTP-656 in substantially the form attached hereto as Exhibit F-2 (the "**Buyer Orphan Designation Letter**"); and

(f) Buyer shall have delivered to Seller all other items listed in Section 1.03(b) not otherwise delivered under this Section 5.03.

ARTICLE VI

INDEMNIFICATION

Section 6.01 Survival.

(a) Other than claims alleging fraud or willful or intentional misconduct or breach of this Agreement, the representations and warranties of Seller and Buyer set forth in this Agreement and the certificates delivered at Closing pursuant to Sections 5.02(c) and 5.03(c) shall survive the Closing for a period of eighteen (18) months from the Closing Date, other than for the representations and warranties of Seller contained in Section 2.01 (Organization, Qualification and Corporate Power), Section 2.02 (Title to Assets), Section 2.03 (Authority),Section 2.05 (Non-Contravention; Consents) and Section 2.17 (Brokers' Fees), and of Buyer contained in Sections 3.01 (Organization), Section 3.02 (Authorization of Transaction) and Section 3.04 (Brokers' Fees), (collectively, the "**Fundamental Representations**"), which shall survive the Closing until the date that is sixty (60) days after the expiration of the applicable statute of limitations.

(b) The covenants and agreements to be performed by or on behalf of a Party prior to the Closing shall survive the Closing for a period of twenty four (24) months from the Closing Date. The covenants or other agreements contained in this Agreement that by their terms are to be performed by or on behalf of a Party after the Closing shall survive until the date that such covenants and agreements are fully performed.

(c) No Person shall be liable for any claim for indemnification under this Article VI unless a Claim Notice is delivered by the Person seeking indemnification to the Person from whom indemnification is sought prior to the expiration of the applicable survival period, in which case the representation, warranty, covenant or agreement which is the subject of such claim shall survive, to the extent of the claims described in such Claim Notice only, until such claim is resolved, whether or not the amount of the Damages resulting from such breach has been finally determined at the time the notice is given.

(d) The right of a Person to any remedy pursuant to this Article VI shall not be affected by any investigation or examination conducted, or any knowledge possessed or acquired (or capable of being possessed or acquired), by such Person at any time concerning any circumstance, action, omission or event relating to the accuracy or performance of any representation, warranty, covenant or obligation.

Section 6.02 **Indemnification by Seller**. Subject to the terms and conditions of this Article VI, from and after the Closing, Seller shall defend, indemnify and hold harmless Buyer and its Subsidiaries and their respective officers, directors, Affiliates, stockholders, members, partners and each of the heirs, executors, successors and assigns of any of the foregoing (collectively, the "**Buyer Indemnified Parties**") in respect of any and all Damages incurred as a result or arising out of:

(a) any (i) breach of any representation or warranty of Seller in this Agreement or the certificate of Seller delivered at the Closing pursuant to Section 5.02(c) (without giving effect to any "Seller Material Adverse Effect" or other materiality threshold or qualifier contained therein, except in the case of the representation contained in Section 2.07(c)), or (ii) failure to perform any covenant or agreement of Seller contained in this Agreement or the Related Agreements;

(b) Seller's and its Affiliates' failure, fully or timely, to pay, satisfy or perform the Excluded Liabilities;

(c) any Tax for which Seller is responsible pursuant to Section 8.01;

(d) any Tax imposed on or relating to Acquired Assets that is attributable to any Pre-Closing Tax Period;

(e) any failure by Seller, or claim by a creditor of Seller that Seller has failed to comply with the provisions of any applicable bulk sales, bulk transfer or similar Laws; or

(f) all costs and Liabilities, including product Liability, associated with the open-label Phase 2 clinical trial of CTP-656 in Europe, including all costs associated with termination of such clinical trial.

Section 6.03 **Indemnification by Buyer**. Subject to the terms and conditions of this Article VI, from and after the Closing, Buyer shall indemnify Seller and its Subsidiaries and their respective officers, directors, Affiliates, stockholders, members, partners and each of the heirs, executors, successors and assigns of any of the foregoing (collectively, the "**Seller Indemnified Parties**") in respect of, and hold the Seller Indemnified Parties harmless against, any and all Damages incurred as a result or arising out of:

(a) any (i) breach of any representation or warranty of Buyer contained in Article III of this Agreement or the certificate of Buyer delivered at the Closing pursuant to Section 5.03(c) (without giving effect to any "Buyer Material Adverse Effect" or other materiality threshold or qualifier contained therein), or (ii) failure to perform any covenant or agreement of Buyer contained in this Agreement or the Related Agreements;

(b) Buyer's and its Affiliates' failure, fully or timely, to pay, satisfy or perform the Assumed Liabilities;

(c) any Tax for which Buyer is responsible pursuant to Section 8.01; or

(d) any Tax imposed on or relating to Acquired Assets that is attributable to any Post-Closing Tax Period.

Section 6.04 **Claims for Indemnification**.

(a) Third Party Claims.

(i) All claims for indemnification made under this Agreement resulting from, related to or arising out of a Third Party claim, action, suit or proceeding (a "**Third**

Party Claim") against an Indemnified Party shall be made in accordance with the following procedures. A Person entitled to indemnification under this Article VI (an "**Indemnified Party**") shall give prompt written notification to the Person from whom indemnification is sought (the "**Indemnifying Party**") of the commencement of any Third Party Claim for which indemnification may be sought or, if earlier, upon the written assertion of any such Third Party Claim; provided, however, that no delay on the part of the Indemnified Party in notifying the Indemnifying Party shall relieve the Indemnifying Party of any Liability hereunder, except to the extent that the Indemnifying Party has been materially prejudiced thereby, and then only to such extent. Within twenty (20) days after delivery of such notification, the Indemnifying Party may, upon written notice thereof to the Indemnified Party, assume control of the defense of such Third Party Claim, so long as prior to the Indemnifying Party assuming control of such defense, it has provided reasonable assurance to the Indemnified Party (A) of its financial ability to assume the cost of such Third Party Claim and (B) that, as between the Indemnifying Party and the Indemnified Party, any Damages related to such Third Party Claim shall be the responsibility of the Indemnifying Party (subject to any applicable limitations provided in Section 6.05); provided, that the Indemnifying Party shall not be entitled to assume control of such defense and shall pay the fees and expenses of counsel retained by the Indemnified Party if (i) the Third Party Claim seeks an injunction or other equitable or non-monetary relief, (ii) the maximum amount the Indemnified Party would be entitled to recover under this Article VI in respect of such Third Party Claim is anticipated to be more than the Cap, (iii) the Indemnified Party has been advised in writing by its counsel that a reasonable likelihood exists of a conflict of interest between the Indemnifying Party and the Indemnified Party, and (iv) upon petition by the Indemnified Party, the appropriate court rules that the Indemnifying Party failed or is failing to vigorously prosecute or defend such Third Party Claim. If the Indemnifying Party does not assume control of such defense in accordance with the terms hereof, the Indemnified Party shall control such defense.

(ii) The Party not controlling such defense may participate therein at its own expense and may retain separate co-counsel at its own expense; provided, that if (A) the Indemnifying Party shall have failed, or is not entitled, to assume the defense of such Third Party Claim in accordance with Section 6.04(a)(i), (B) the employment of such counsel has been specifically authorized in writing by the Indemnifying Party, which authorization shall not be unreasonably withheld, conditioned or delayed, or (C) the named parties to any such action (including any impleaded parties) include both such Indemnified Party and the Indemnifying Party and such Indemnified Party shall have been advised in writing by such counsel that there may be one (1) or more legal defenses available to the Indemnified Party which are not available to the Indemnifying Party, or are available to the Indemnifying Party but the assertion of which would be adverse to the interests of the Indemnified Party, the reasonable fees and expenses of counsel to the Indemnified Party solely in connection therewith shall be considered Damages for purposes of this Agreement; provided, however, that in no event shall the Indemnifying Party be responsible for the fees and expenses of more than one (1) counsel for all Indemnified Parties. The Party controlling such defense shall keep the other Party advised of the status of such Third Party Claim and the defense thereof and shall consider recommendations made by the other Party with respect thereto.

(iii) The Indemnified Party shall not agree to any settlement of such Third Party Claim without the prior written consent of the Indemnifying Party, which consent shall not be unreasonably withheld, conditioned or delayed so long as the Indemnifying

Party is actively and diligently defending in good faith any such Third Party Claim. The Indemnifying Party shall not agree to any settlement of (y) such Third Party Claim that (A) does not include a complete and unconditional release of the Indemnified Party from all Liability with respect thereto, (B) has a finding or admission of any violation of Law or any violation of the rights of any Person, (C) imposes any injunctive relief or other restrictions of any kind or nature on any Indemnified Party or (D) imposes any Liability on the Indemnified Party, or (z) any matters with respect to Taxes that could reasonably be expected to adversely impact Buyer or the Acquired Assets in any Post-Closing Tax Period, in each case without the prior written consent of the Indemnified Party, which consent shall not be unreasonably withheld, conditioned or delayed. Each of the Indemnifying Party and the Indemnified Party shall direct their respective counsel to reasonably cooperate with the other.

(b) Procedure for Other Claims. An Indemnified Party wishing to assert a claim for indemnification under this Article VI which is not subject to Section 6.04(a) shall deliver to the Indemnifying Party a written notice (a "**Claim Notice**") which contains (i) a description and, if then known, the amount (the "**Claimed Amount**") of any Damages incurred by the Indemnified Party or the method of computation of the amount of such claim of any Damages, (ii) a statement that the Indemnified Party is entitled to indemnification under this Article VI and a reasonable explanation of the basis therefor, and (iii) a demand for payment in the amount of such Damages (including wire instructions if payment is requested to be made by wire transfer). Within twenty (20) days after delivery of a Claim Notice, the Indemnifying Party shall deliver to the Indemnified Party a written response in which the Indemnifying Party shall (A) agree that the Indemnified Party is entitled to receive all of the Claimed Amount (in which case, within five (5) Business Days of such response, the Indemnifying Party shall, as applicable, pay to the Indemnified Party by check or by wire transfer, or Seller and Buyer shall deliver joint written instructions to the Escrow Agent to release to the Indemnified Party from the Escrow Amount an amount equal to the Claimed Amount to the bank account or accounts designated by the Indemnified Party in a notice to the Indemnifying Party not less than two (2) Business Days prior to such payment), (B) agree that the Indemnified Party is entitled to receive part, but not all, of the Claimed Amount (the "**Agreed Amount**") (in which case, within five (5) Business Days of such response, the Indemnifying Party shall, as applicable, pay to the Indemnified Party by check or by wire transfer, or Seller and Buyer shall deliver joint written instructions to the Escrow Agent to release to the Indemnified Party from the Escrow Amount an amount equal to the Agreed Amount to the bank account or accounts designated by the Indemnified Party in a notice to the Indemnifying Party not less than two (2) Business Days prior to such payment), or (C) contest that the Indemnified Party is entitled to receive any of the Claimed Amount including the reasons therefor. If the Indemnifying Party in such response contests the payment of all or part of the Claimed Amount, the Indemnifying Party and the Indemnified Party shall use commercially reasonable efforts to resolve such dispute. If such dispute is not resolved within sixty (60) days following the delivery by the Indemnifying Party of such response, the Indemnifying Party and the Indemnified Party shall each have the right to submit such dispute to a court of competent jurisdiction in accordance with the provisions of Section 10.09.

Section 6.05 Limitations. (a) Subject to Section 10.13, from and after the Closing, the rights of the Indemnified Parties under this Article VI shall be the sole and exclusive remedies of the Indemnified Parties with respect to claims resulting from any breach of warranty or failure to perform any covenant or agreement contained in this Agreement or any Related Agreement or otherwise relating to the transactions that are the subject of this Agreement. Notwithstanding the foregoing or anything in this Agreement to the contrary, nothing contained in this Agreement shall relieve or limit the Liability of any Party or any officer or director of such Party from any liability arising out of or resulting from fraud or intentional or willful misconduct in connection with the transactions contemplated by this Agreement or the Related Agreement, or in connection with the delivery of any of the documents referred to herein or therein.

(b) Notwithstanding anything to the contrary contained in this Agreement, each of the following limitations shall apply:

(i) the aggregate liability of Seller for all Damages (y) under Section 6.02(a)(i) (other than in respect of fraud or intentional or willful misconduct by Seller or in respect of any Fundamental Representation of Seller) shall not exceed an amount equal to the Escrow Amount (the "**Cap**"); and (z) other than in respect of fraud or intentional or willful misconduct by Seller, under Section 6.02(a) shall not exceed an amount equal to the sum of the Base Purchase Price and any Contingent Payment paid pursuant to Section 1.02(b);

(ii) a Buyer Indemnified Party shall have no right to indemnification under Section 6.02(a)(i) (other than in respect of fraud or intentional or willful misconduct by Seller or in respect of any Fundamental Representation of Seller, in each case, as to which the limitation shall not apply) unless and until the amount of Damages suffered by such Buyer Indemnified Party with respect to an individual claim under such sections exceeds $50,000 (it being stated for the avoidance of doubt that Damages arising from any potential indemnification claims that arise out of or involve or relate to similar facts or are based on related or similar occurrences, events or circumstances will be aggregated and treated as an individual claim for this purpose) and the aggregate amount of Damages suffered by such Buyer Indemnified Party under such section exceeds $1,600,000 (the "**Aggregate Threshold**"), whereupon the Buyer Indemnified Parties shall be indemnified for all Damages (including Damages up to the Aggregate Threshold), subject to the limitations contained in Section 6.05(b)(i);

(iii) the aggregate liability of Buyer for all Damages (y) under Section 6.03(a)(i) (other than on account of fraud or intentional or willful misconduct by Buyer or in respect of any Fundamental Representation of Buyer) shall not exceed an amount equal to the Cap; and (z) other than on account of fraud or willful misconduct by Buyer, under Section 6.03(a) shall not exceed an amount equal to the sum of the Base Purchase Price and any Contingent Payment paid pursuant to Section 1.02(b); and

(iv) a Seller Indemnified Party shall have no right to indemnification under Section 6.03(a)(i) (other than on account fraud or intentional or willful misconduct by Buyer or in respect of any Fundamental Representation of Buyer, in each case, as to which the limitation shall not apply) unless and until the amount of Damages suffered by such Seller Indemnified Party with respect to an individual claim under such sections exceeds $50,000 (it being stated for the avoidance of doubt that Damages arising from any potential indemnification claims that arise out of or involve or relate to similar facts or are based on related or similar occurrences, events or circumstances will be aggregated and treated as an individual claim for this purpose) and the aggregate amount of Damages suffered by such Seller Indemnified Party under such sections exceeds the Aggregate Threshold, whereupon the Seller Indemnified Parties shall be indemnified for all Damages (including Damages up to the Aggregate Threshold), subject to the limitations contained in Section 6.05(b)(iii).

(c) In no event shall any Indemnifying Party be responsible and liable under this Article VI for special or punitive Damages, except to the extent that any of the foregoing are awarded to a Third Party against any Indemnified Party in circumstances in which such Indemnified Party is entitled to indemnification hereunder. In no event shall any Indemnifying Party be responsible and liable under this Article VI for indirect, consequential or incidental Damages except to the extent that (i) such Damages are awarded to a Third Party against any Indemnified Party in circumstances in which such Indemnified Party is entitled to indemnification hereunder, or (ii) such Damages are a reasonably foreseeable result of the event that gave rise thereto or the matter for which indemnification is sought hereunder.

(d) The amount of any Damages for which indemnification is provided under this Article VI shall be computed net of any Third Party insurance proceeds actually received by the Indemnified Party (net of any retroactive premium adjustments and any other costs of collection), each Party agreeing (i) to use commercially reasonable efforts to recover all available insurance proceeds and (ii) to the extent any indemnity payment under this Agreement has been paid by the Indemnifying Party to or on behalf of the Indemnified Party prior to the receipt, directly or indirectly by the Indemnified Party of any net insurance proceeds under Third Party insurance policies on account of such Damages which duplicate, in whole or in part, the payment by the Indemnifying Party to or on behalf of the Indemnified Party, the Indemnified Party shall remit to the Indemnifying Party an amount equal to the amount of the net insurance proceeds actually received by the Indemnified Party on account of such Damages which duplicate, in whole or in part, the payment made by the Indemnifying Party to or on behalf of the Indemnified Party. No Party shall be entitled to recover more than once for the same Damages.

Section 6.06 **Manner of Payment**. Subject to the limitations set forth in Section 6.05(b), any indemnification of Buyer pursuant to Section 6.02 shall be effected (i) first, by release of funds held by the Escrow Agent with respect to indemnification of Buyer pursuant to Section 6.02 for any Damages incurred up to an amount equal to the Escrow Amount pursuant to the terms of the Escrow Agreement and (ii) second, to the extent of any difference, by wire transfer of immediately available funds from Seller to an account designated in writing by Buyer. In the event any payment is to be made from the Escrow Account in accordance with this Section 6.06, Seller and Buyer shall deliver joint written instructions to the Escrow Agent to release to the Indemnified Party from the Escrow Account the appropriate amount by wire transfer in immediately available funds to the bank account or accounts designated by the Indemnified Party in a notice to the Indemnifying Party not less than two (2) Business Days prior to such payment.

Section 6.07 **Right of Setoff**. Upon notice to Seller specifying in reasonable detail the basis therefor, Buyer may, at its sole discretion, set off any amount to which it may be entitled under this Article VI that is the subject of a final, non-appealable decision from a court of competent jurisdiction against amounts otherwise payable pursuant to Section 1.02.

Section 6.08 **Adjustment to Purchase Price**. Any payment by Buyer or Seller, as the case may be, pursuant to this Article VI shall be treated as an adjustment to the Base Purchase Price for Tax purposes unless otherwise required by applicable Law.

Section 6.09 **Release of the Escrow Account**. On the eighteen (18) month anniversary of the Closing Date, to the extent the amount remaining in the Escrow Account exceeds any amounts which are the subject of any unresolved or unsatisfied claims for indemnifiable Damages pursuant to Section 6.02 that were properly made on or prior to the eighteen (18) month anniversary of the Closing Date in accordance with the provisions of this Article VI, Buyer and Seller shall deliver to the Escrow Agent a joint written instruction in accordance with the terms of the Escrow Agreement to the effect that the Escrow Agent release any such excess amount to Seller as of such date. To the extent any amounts are retained in the Escrow Account pursuant to the immediately preceding sentence, Buyer and Seller shall instruct the Escrow Agent to release such funds, following the resolution of each such claim, to Buyer or to Seller in accordance with the resolution of the applicable claim, as appropriate.

ARTICLE VII

TERMINATION

Section 7.01 **Termination of Agreement**. The Parties may terminate this Agreement prior to the Closing as provided below:

(a) by mutual written agreement of Seller and Buyer;

(b) by Buyer if a breach of any representation or warranty or failure to perform any covenant or agreement on the part of Seller set forth in this Agreement shall have occurred that would cause any of the conditions set forth in Section 5.02(a) or (b) not to be satisfied, and such breach is incapable of being cured or not cured within thirty (30) days following Buyer's delivery of notice to Seller of such breach or failure to perform, provided, that Buyer may terminate this Agreement pursuant to this Section 7.01(b) only if, at the time of termination, Buyer is not in material breach of any of its representations, warranties, covenants or agreements contained in this Agreement;

(c) by Seller if a breach of any representation or warranty or failure to perform any covenant or agreement on the part of Buyer set forth in this Agreement shall have occurred that would cause any of the conditions set forth in Section 5.03(a) or (b) not to be satisfied, and such breach is incapable of being cured or not cured within thirty (30) days following Seller's delivery of notice to Buyer of such breach or failure to perform, provided, that Seller may terminate this Agreement pursuant to this Section 7.01(c) only if, at the time of termination, Seller is not in material breach of any of its representations, warranties, covenants or agreements contained in this Agreement;

(d) by Buyer, if the Seller Board (i) fails to make the Seller Board Recommendation referred to in Section 4.06(d) or shall fail to include in the Proxy Statement the Seller Board Recommendation, (ii) effects a Seller Change of Recommendation, (iii) authorizes, approves or recommends to Seller's stockholders, or otherwise authorizes, approves or publicly recommends, an Alternative Transaction or (iv) fails to publicly confirm the Seller Board Recommendation within ten (10) Business Days after a written request (which request must be reasonable under the circumstances) by Buyer that it do so following Seller's receipt of an Alternative Transaction;

(e) by Buyer, if there shall have been a material breach by Seller of Section 4.06 or Section 4.07;

(f) by Buyer or Seller by written notice to the other if;

(i) the condition set forth in Section 5.01(b) or Section 5.01(c) is not satisfied and the Order, stipulation or injunction giving rise to such non-satisfaction has become final and non-appealable; provided, however, that the right to terminate this Agreement pursuant to this Section 7.01(f)(i) shall not be available to any party that has failed to perform fully its obligations under this Agreement in any manner that shall have proximately caused or resulted in the imposition of such Order, stipulation or injunction or the failure of such Order, stipulation or injunction to be resisted, resolved or lifted;

(ii) the Closing shall not have occurred on or before October 31, 2017 (the "**Outside Date**"); provided, however, that no Party may terminate this Agreement pursuant to this Section 7.01(f)(ii) if such Party's material breach of any representation, warranty, covenant or other obligation under this Agreement shall have proximately caused or resulted in the Closing not having occurred on or prior to the Outside Date; or

(iii) the Seller Stockholder Approval is not obtained at the Seller Special Meeting or at any adjournment or postponement thereof, in each case at which a vote on such approval was taken; or

(g) by Seller, provided, that it has complied with its obligations under Section 4.06 and Section 4.07, at any time prior to obtaining the Seller Stockholder Approval at the Seller Special Meeting or at any adjournment or postponement thereof, in order to concurrently enter into a binding agreement for an Alternative Transaction that constitutes a Superior Proposal, if prior to or concurrently with such termination, Seller pays the Termination Fee (as defined in Section 7.02(b)); or

(h) by Buyer within five (5) Business Days following the cure period set forth in Section 7.01(b) upon receipt by Buyer of a Supplement pursuant to Section 4.04, if the Supplement gives rise to a breach that is not cured within the cure period.

Section 7.02 Effect of Termination.

(a) To terminate this Agreement as provided in Section 7.01 (except in the case of termination pursuant to Section 7.01(a)), the terminating party shall have given written notice to the other Party specifying the subsection of Section 7.01 pursuant to which such termination is made, and this Agreement shall forthwith become null and void and there will be no liability of any Party (or any stockholder or Representative of such Party) to each other Party hereto, except with respect to the Confidentiality Agreement, this Section 7.02, Section 9.04 and Article X; provided, that no such termination shall relieve any Party from liability for any damages resulting from fraud or a willful breach of its representations, warranties or covenants set forth in this Agreement prior to such termination and any aggrieved Party will be entitled to all rights and remedies under applicable Law or in equity.

(b) Seller Termination Fee. (i) If this Agreement is terminated pursuant to:

(A) Section 7.01(d) or Section 7.01(e);

(B) Section 7.01(f)(ii) and (x) a vote of the stockholders of Seller contemplated by this Agreement at the Seller Special Meeting to obtain the Seller Stockholder Approval has not occurred and (y) a proposal with respect to an Alternative Transaction shall have been publicly proposed or announced or otherwise publicly disclosed and not withdrawn after the date of this Agreement and prior to the date of termination of this Agreement;

(C) Section 7.01(b) or Section 7.01(f)(iii), and, in either case, a proposal with respect to an Alternative Transaction shall have been publicly proposed or announced or otherwise publicly disclosed and not withdrawn after the date of this Agreement and prior to the date of the Seller Special Meeting; or

(D) Section 7.01(g);

then (x) in the case of a termination contemplated by Section 7.02(b)(i)(A), Seller shall pay or cause to be paid to Buyer within two (2) Business Days following the termination of this Agreement, a fee, by wire transfer in immediately available funds to an account specified by Buyer, equal to $6,400,000 (the "**Termination Fee**"); (y) in the case of termination contemplated by Section 7.02(b)(i)(D), Seller shall pay or cause to be paid to Buyer the Termination Fee on the date of termination of this Agreement; and (z) in the case of a termination contemplated by Section 7.02(b)(i)(B) or Section 7.02(b)(i)(C), if Seller, within twelve (12) months after such termination either consummates an Alternative Transaction or enters into a definitive agreement to implement an Alternative

Transaction, Seller shall pay to Buyer the Termination Fee simultaneously with such consummation or entering into such definitive agreement, as the case may be. For purposes of clause (z) of this Section 7.02(b)(i), each reference to "15%" in the definition of "Alternative Transaction" shall be deemed to be a reference to "50%."

(ii) If Buyer or Seller terminates this Agreement pursuant to Section 7.01(f)(iii), then Seller shall reimburse Buyer, or cause Buyer to be reimbursed, for Buyer's reasonable, documented out-of-pocket expenses incurred in connection with this Agreement and the transactions contemplated hereby, provided, however, Seller's aggregate liability under this Section 7.02(b)(ii) shall not exceed an amount equal to $500,000.

(iii) In no event shall Seller be obligated to pay the Termination Fee on more than one occasion.

(c) Seller acknowledges that (i) the agreements contained in this Section 7.02 are an integral part of the transactions contemplated by this Agreement and that without this Section 7.02 Buyer would not have entered into this Agreement and (ii) the Termination Fee is not a penalty, but rather is liquidated damages in a reasonable amount that will compensate Buyer in the circumstances in which the Termination Fee is payable for the efforts and resources expended and opportunities foregone while negotiating this Agreement and in reliance on this Agreement and on the expectation of the consummation of the transactions contemplated hereby. If Seller fails to promptly pay any amount due pursuant to this Section 7.02, Seller shall pay to Buyer all reasonable fees, costs and expenses of enforcement (including reasonable attorney's fees as well as reasonable expenses incurred in connection with any action initiated by Buyer), together with interest on the amount of the Termination Fee at the prime lending rate as published in *The Wall Street Journal*, Eastern Edition, in effect on the date such payment is required to be made.

(d) If Seller becomes obligated to pay the Termination Fee pursuant to Section 7.02(b), Buyer agrees that Buyer's right to receive the Termination Fee from Seller shall be Buyer's sole and exclusive remedy against Seller, its Subsidiaries, Affiliates and their respective Representatives and, upon payment of the Termination Fee, neither Seller, its Subsidiaries, Affiliates nor their respective Representatives shall have any Liability or obligation to Buyer relating to or arising out of this Agreement or the transactions contemplated hereby.

(e) In the event that this Agreement is terminated (i) by either Buyer or Seller pursuant to Section 7.01(f)(ii), and at the time of such termination any of the conditions set forth in Section 5.01(b) or (c) (under conditions attributable to one or more Antitrust Laws) or Section 5.01(d) shall not have been satisfied or waived or (ii) by either Buyer or Seller pursuant to Section 7.01(f)(i) (under conditions attributable to one or more Antitrust Laws), and at the time of such termination under either Section 7.01(f)(i) or Section 7.01(f)(ii), all conditions set forth in Article 5 other than those attributable to Antitrust Laws have been satisfied or waived by the party or parties then entitled to give such waiver (other than those conditions that by their terms are to be satisfied as of the Closing, provided, that each such condition is then capable of being satisfied), then Buyer shall reimburse Seller, or cause Seller to be reimbursed, for Seller's reasonable, documented out-of-pocket expenses incurred in connection with this Agreement and the transactions contemplated hereby, provided, however, that Buyer's aggregate liability under this Section 7.02(e) shall not exceed an amount equal to $500,000.

ARTICLE VIII

TAX MATTERS

Section 8.01 **Certain Tax Matters**. Buyer shall be responsible for the payment of any transfer, sales, use, stamp, conveyance, value added, recording, registration, documentary, filing and other non-income Taxes and administrative fees (including notary fees) arising in connection with the consummation of the transactions contemplated by this Agreement ("**Transfer Taxes**"). Buyer shall, at its own expense, timely file any Tax Return or other document with respect to such Taxes or fees (and Seller shall cooperate with respect thereto as necessary). Buyer and Seller shall use commercially reasonable efforts to cooperate with each other to minimize any Transfer Taxes.

Section 8.02 **Withholding Taxes**. Each of Buyer and Escrow Agent shall be entitled to deduct and withhold from any consideration payable or otherwise deliverable to Seller or any other Person pursuant to this Agreement (including the Contingent Payments, if any) all Taxes that Buyer or the Escrow Agent, as the case may be, are required to deduct or withhold therefrom under any applicable provision of Tax Law with respect to the making of such payment. All such withheld amounts shall be treated as delivered to Seller; provided, that Buyer or the Escrow Agent shall remit or cause to be remitted to the applicable Governmental Entity the amounts withheld as required under any applicable provision of Tax Law. Buyer shall, to the extent reasonable, notify Seller if any such withholding is required.

ARTICLE IX

FURTHER AGREEMENTS

Section 9.01 **Post-Closing Information**. After the Closing, Buyer shall respond to reasonable, written requests for information and assistance by Seller in connection with Seller completing the audit of its accounts and preparation of its required federal, state and local Tax Returns.

Section 9.02 **Wrong Pockets.** If either Buyer, on the one hand, or Seller, on the other hand, becomes aware that any of the Acquired Assets has not been transferred to Buyer or that any of the Excluded Assets has been transferred to Buyer, Buyer or Seller, as applicable, shall promptly notify the other and the Parties shall, as soon as reasonably practicable, ensure that such property is transferred, with any necessary prior Third Party consent or approval, to (a) Buyer, in the case of any Acquired Asset which was not transferred to Buyer at the Closing; or (b) Seller, in the case of any Excluded Asset which was transferred to Buyer at the Closing.

Section 9.03 **Use of Names**. After the Closing Date, Seller shall, and shall cause its Affiliates to, cease to use the names set forth on Section 9.03 of the Seller Disclosure Letter and any name confusingly similar thereto (collectively, the "**Restricted Names**") and any trademarks, trade names, trade dress, service marks and logos that use or incorporate any Restricted Name. Seller agrees that from and after the Closing, Seller shall not have any right, title, interest, license or other right whatsoever in the Restricted Names. Seller shall, and shall cause its Affiliates to, remove, strike over or obliterate all Restricted Names and any trademarks, trade names, trade dress, service marks and logos that use or incorporate any Restricted Name from the Excluded Assets (it being understood that this requirement shall not apply to fair use of any Restricted Name, including, but not limited to, in documents and materials kept as records that are maintained for internal use only and not publicly disseminated, or to be archived as such records, for historical purposes or as required by applicable Law). Any use of the Restricted Names by Seller as permitted in this Section 9.03 is subject to its use of each Restricted Name in the same form and manner as, to the same extent as (without an increase in extent or type of uses of each Restricted Name) and subject to the same standards of quality that are in effect for each Restricted Name as of the Closing Date. All goodwill arising from any such use shall inure to the benefit of Buyer or an applicable Affiliate of Buyer owning the Restricted Name so used. Seller shall not to use any Restricted Name in any manner that may reflect negatively on such name and mark or on Buyer or any of its Affiliates.

Section 9.04 Confidentiality.

(a) From and after the date of this Agreement until the Closing, Buyer and Seller each agree they will be bound by and comply with the obligations of the Confidentiality Agreement. After the Closing Date, Buyer's obligations with respect to Confidential Material under the Confidentiality Agreement shall be deemed to have been terminated by and the Confidentiality Agreement shall no longer be binding upon Buyer.

(b) Seller acknowledges that it is in possession of Confidential Material. Seller shall, and shall cause each of its Affiliates and their respective Representatives to, (i) treat confidentially and not disclose all or any portion of such Confidential Material and use such Confidential Material solely for the purpose of fulfilling its obligations under this Agreement and the Related Agreements and for no other purpose, in each case, following the Closing Date and (ii) from the date hereof and until the Closing Date, use Confidential Material for the sole purpose of developing and operating the Acquired Assets in the Ordinary Course and to consummate the transactions contemplated by this Agreement. Seller acknowledges and agrees that such Confidential Material is proprietary and confidential in nature and may be disclosed to its Representatives only to the extent necessary for Seller to consummate the transactions contemplated by this Agreement (it being understood that Seller shall be responsible for any disclosure by any such Representative not permitted by this Agreement). If, following the Closing Date, Seller or any of its Affiliates or their respective Representatives are requested or required to disclose (after Seller has used its commercially reasonable efforts to avoid such disclosure and after promptly advising and consulting with Buyer about Seller's intention to make, and the proposed contents of, such disclosure) any of the Confidential Material (whether by deposition, interrogatory, request for documents, subpoena, civil investigative demand or similar process), Seller shall, or shall cause such Affiliate or Representative, to provide Buyer with prompt written notice of such request so that Buyer may seek an appropriate protective order or other appropriate remedy. At any time that such protective order or remedy has not been obtained, Seller or such Affiliate or Representative may disclose only that portion of the Confidential Material which such Person is legally required to disclose or of which disclosure is required to avoid sanction for contempt or any similar sanction, and Seller shall exercise its commercially reasonable efforts to obtain assurance that confidential treatment will be accorded to such Confidential Material so disclosed. Seller further agrees that, from and after the Closing Date, Seller and its Affiliates and Representatives, upon the request of Buyer, promptly will deliver to Buyer all documents, or other tangible embodiments, constituting Confidential Material or other information with respect to the Acquired Assets, without retaining any copy thereof, and shall promptly destroy all other information and documents constituting or containing Confidential Material; provided, however, that Seller or its Representatives shall be permitted to retain one archival copy of any Confidential Material for record purposes and to evidence Seller's compliance with this Agreement or applicable Law, and in addition, nothing in this Agreement shall require the alteration, modification, deletion or destruction of back-up tapes or other media made in the ordinary course of business.

Section 9.05 Restrictive Covenants. (a) During the period beginning on the Closing Date and ending on the fifth (5th) anniversary of the Closing Date (the "**Non-Compete Period**"), Seller covenants and agrees not to, and shall cause its Affiliates not to, directly or indirectly anywhere in the world, acquire or Develop, Manufacture or Commercialize any compound or product or file any Intellectual Property related thereto, in each case with the intention of treating cystic fibrosis, and shall not control, advise, enable, provide services to, fund or guarantee the obligations of, any Third Party engaged in, or planning to engage in, any of the foregoing. Notwithstanding the foregoing, nothing in this

Section 9.05 shall restrict, place conditions on or impede Seller from the current or planned (each as of the Closing Date) Development, Manufacturing, or Commercialization of any Excluded Therapeutic Products.

(b) During the period beginning on the date of this Agreement and ending on the date that is twelve (12) months after the earlier of (i) termination of this Agreement in accordance with its terms and (ii) the Closing Date, each of Buyer and Seller shall not, and shall cause their respective Affiliates not to, directly or indirectly, solicit for employment or employ or cause to leave the employ of the other Party or any of its Affiliates, any employee of the other Party or its Affiliates, without obtaining the prior written consent of the other Party; provided that each Party may make general solicitations for employment not specifically directed at the other Party or any of its Affiliates or their respective employees and employ any person who responds to such solicitations.

(c) Seller shall instruct its officers and directors, and shall cause its Affiliates to instruct their officers and directors, not to directly or indirectly through any other Person (whether as an officer, manager, director, employee, partner, consultant, holder of equity or debt investment, lender or in any other manner or capacity), engage in conduct, oral or otherwise, that disparages or damages or would reasonably be expected to disparage or damage any of Buyer, its Affiliates or any of their respective current or former Representatives, holders of equity or debt investments, lenders, businesses, activities, operations or reputations.

(d) As a material inducement to Buyer's execution of this Agreement (without such inducement Buyer would not have entered into this Agreement), Seller acknowledges and agrees that the provisions of this Section 9.05 are reasonable and necessary to protect the legitimate business interests of Buyer and its acquisition of the Acquired Assets. Seller shall not contest that Buyer's remedies at law for any breach or threat of breach by Seller or any of its Affiliates of the provisions of this Section 9.05 will be inadequate, and that Buyer shall be entitled to an injunction or injunctions to prevent breaches or threatened breaches of the provisions of this Section 9.05 and to enforce specifically such terms and provisions, in addition to any other remedy to which Buyer may be entitled at Law or equity, as well as the reasonable costs and attorneys' fees it incurs in enforcing the provisions contained in this Section 9.05. The covenants contained in this Section 9.05 are covenants independent of any other provision of this Agreement or any other agreement between the Parties hereunder, and the existence of any claim Seller may have against Buyer under any other provision of this Agreement or otherwise, shall not constitute a defense to the enforcement of the provisions contained in this Section 9.05. Seller further agrees that should it violate any provisions contained in this Section 9.05, the Non-Compete Period shall extend for an additional time period that is equal to the term of such violation so that Buyer is provided with the full benefit of the restrictive period set forth in this Section 9.05.

(e) If any of the provisions contained in this Section 9.05 shall for any reason be held by a court of competent jurisdiction to be excessively broad as to duration, scope, activity or subject, then such provision shall be construed by limiting and reducing it with respect to such jurisdiction, only to the extent necessary so as to be valid and enforceable to the extent compatible with the applicable Law of such jurisdiction.

Section 9.06 **FDA Letters**. Promptly after the Closing (but in no event later than two (2) Business Days following the Closing), Seller shall file, or cause to be filed, with the FDA the Seller FDA Letter, the Buyer FDA Letter, the Seller Orphan Designation Letter and the Buyer Orphan Designation Letter and shall provide an as-filed copy of each such letter to Buyer.

ARTICLE X

MISCELLANEOUS

Section 10.01 **Certain Definitions**. For the purposes of this Agreement, the term:

"**Affiliates**" has the meaning set forth in Rule 12b-2 of the Exchange Act.

"**Alternative Transaction**" means, whether or not proposed in writing, any of the following events (in each case in a single transaction or series of related transactions): (i) any sale, lease, contribution or other disposition, directly or indirectly (including by way of merger, consolidation, share exchange, tender offer, exchange offer, other business combination, partnership, joint venture, sale of capital stock of or other equity interests in Subsidiaries or otherwise) to any Third Party of (A) Acquired Assets (other than sales, dispositions or transfers in the Ordinary Course), or (B) beneficial ownership of fifteen percent (15%) or more of the combined voting securities of Seller or of any resulting parent company of Seller (excluding voting securities acquired in open market purchases), or (ii) any issuance, sale or other disposition, directly or indirectly, to any Third Party (or the shareholders of any Third Party) of securities (or options, rights or warrants to purchase, or securities convertible into or exchangeable for, such securities) representing fifteen percent (15%) or more of the combined voting securities of Seller (excluding voting securities acquired in open market purchases), in each case other than transactions contemplated by this Agreement.

"**Anti-Bribery Law**" means (i) the U.S. Foreign Corrupt Practices Act of 1977, as amended, and the rules and regulations issued thereunder, and (ii) any law, rule, regulation, or other legally binding measure of any jurisdiction including, without limitation, the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, or that otherwise relates to bribery or corruption.

"**Antitrust Laws**" means the Sherman Act, 15 U.S.C. §§ 1-7, as amended; the Clayton Act, 15 U.S.C. §§ 12-27, 29 U.S.C. §§ 52-53, as amended; the HSR Act; the Federal Trade Commission Act, 15 U.S.C. § 41-58, as amended; and all other Laws and Orders that are designed or intended to prohibit, restrict or regulate actions having the purpose or effect of monopolization, restraint of trade, or lessening of competition through merger or acquisition.

"**Base Purchase Price**" means $160,000,000.

"**Business Day**" means any day that is not a Saturday or Sunday or a day on which banking institutions located in New York, New York or Boston, Massachusetts are required by Law to remain closed.

"**Buyer Material Adverse Effect**" means any Effect that is materially adverse to the ability of Buyer to consummate the transactions contemplated by this Agreement.

"**Commercialize**" or "**Commercialization**" means all activities related to importing, storing, transporting, distributing, marketing, detailing, and selling a medicinal product or any such use with a view to sale of a medicinal product; and "Commercialization" shall be construed accordingly. Commercialization shall not include Development or Manufacturing.

"**Common Stock**" means the common stock of Seller, par value $0.001 per share.

"**Confidential Material**" means all data and information (whether written or oral) that is confidential, proprietary or is not otherwise generally available to the public regarding the Acquired Assets or the Assumed Liabilities. Notwithstanding the foregoing, the restrictions set forth in Section

9.04 shall not apply to data or information (a) that is or becomes generally available to the public, other than as a result of disclosure by Seller, its Affiliates or their respective Representatives in violation of this Agreement, (b) becomes available to Seller its Affiliates or their respective Representatives from a Person other than a member of the Buyer Group or their respective Representatives on a non-confidential basis, provided, that such Person was not bound by a confidentiality agreement with or other contractual, legal or fiduciary obligation of confidentiality to the Buyer Group or such Representatives with respect to such materials or (c) to the extent not severable, that primarily relates to the Excluded Assets and Excluded Liabilities.

"**Contract**" means any contract, agreement, license, sublicense, indenture, instrument, commitment and any other legally binding agreement, whether written or oral.

"**Damage**" or "**Damages**" means, without duplication, (a) any and all claims, actions, causes of action, judgments, awards, penalties, Liabilities, losses, costs or damages (of any kind including economic, consequential, special, indirect, incidental, punitive, or exemplary losses, costs or damages, including without limitation, lost profits), including reasonable fees and expenses of attorneys, accountants and other professional advisors, whether involving a dispute solely between the parties hereto or otherwise, and (b) any losses or costs incurred in investigating, defending or settling any claim, action or cause of action described in clause (a).

"**DCE Platform Know-How**" means Seller's Know-How, other than Transferred Know-How that has specific application to the ownership, operation or conduct of the CF Enterprise, to Develop, Manufacture or Commercialize deuterium-substituted therapeutic agents, including Know-How to (i) assess compounds as suitable targets for deuterium substitution; (ii) synthesize a wide range of chemical compounds that incorporate deuterium selectively at specific positions and accurately analyze deuterium content at those positions; (iii) optimize assays to evaluate the metabolic stability and metabolite profile of deuterated compounds; (iv) identify deuterated compounds that possess improved in vitro or in vivo metabolic or pharmacokinetic properties relative to the corresponding non-deuterated compound; (v) develop and apply bioanalytical methods to identify and measure metabolites formed by the in vitro and in vivo metabolism of deuterated compounds; (vi) understand how the effects of selective deuterium substitution may translate from in vitro to in vivo systems and from non-human models to humans, and how deuterium substitution affects individual and population-based ADME parameters; (vii) manufacture, analyze, and formulate deuterated compounds, including development of analytical methods for determining level of deuterium incorporation; and (viii) sourcing deuterium reagents, starting materials, and intermediates, and developing and utilizing a supply chain of multiple vendors.

"**Develop**", "**Developed**" or "**Development**" means all activities related to research and development of a medicinal product including, all testing and studies (non-clinical, preclinical and clinical), toxicology testing, pharmacology, statistical analysis, and reporting, together with all other activities with respect to the product useful for the preparation and submission of applications or other filings to a Regulatory Authority to obtain Regulatory Approval for the product and in support of obtaining Regulatory Approval. Development shall not include Manufacturing or Commercialization.

"**Effect**" means any event, occurrence, change, development or effect.

"**EMA**" means the European Medicines Agency or any successor agency that is responsible for reviewing applications seeking approval for the sale of pharmaceuticals in the European Union.

"**Encumbrance**" means any charge, claim, condition, equitable interest, lien, encumbrance, option, pledge, security interest, hypothecation, mortgage, right of first refusal, or any restriction on use, voting, transfer, receipt of income, right of set-off, title retention, or exercise of any other attribute of ownership.

"**Escrow Agent**" means Citibank, N.A.

"**Escrow Agreement**" means the Escrow Agreement to be entered into on the Closing Date in substantially the form attached hereto as Exhibit G.

"**Escrow Account**" means the escrow account to be established and maintained pursuant to the terms of the Escrow Agreement for the Escrow Amount.

"**Escrow Amount**" means, initially, $16,000,000, which amount shall be adjusted to reflect any earnings thereon and any amounts released pursuant to the terms and subject to the conditions set forth in this Agreement and the Escrow Agreement.

"**Exchange Act**" means the Securities Exchange Act of 1934.

"**Excluded Therapeutic Product**" means any product of Seller that is not a Transferred Product, including compounds that are solely intended for use as a treatment of antibacterial infections in patients with cystic fibrosis.

"**GAAP**" means generally accepted accounting principles in the United States.

"**Governmental Entity**" means any United States or non-United States federal, state, provincial or local court, tribunal, arbitrator or arbitral body, the United States Congress or other state or local legislative body, administrative agency or commission or other governmental or regulatory agency or authority or any securities exchange.

"**Indebtedness**" means, with respect to any Person, any principal, interest, premiums or other obligations of such Person (excluding accrued expenses and trade payables), whether or not contingent: (a) in respect of notes payable, accrued interest payable or other obligations for borrowed money, whether secured or unsecured; (b) evidenced by bonds, notes, debentures or similar instruments or letters of credit (or reimbursement agreements in respect thereof); (c) in respect of banker's acceptances; (d) representing capital lease obligations; (e) representing the balance deferred and unpaid of the purchase price of any property or services; (f) representing any hedging obligations, if and to the extent any of the preceding items (other than letters of credit and hedging obligations) would appear as a liability upon a balance sheet of the specified Person prepared in accordance with GAAP; (g) in respect of accrued bonuses owed to any employees of such Person with respect to the 2016 calendar year; (h) any Liability of such Person in respect of banker's acceptances or letters of credit (but solely to the extent drawn and not paid), (i) all prepayment premiums, penalties, costs and/or expenses related to any items of Indebtedness of the type referred to in clauses (a) through (i) above that would be required to be paid as a result of the transactions contemplated hereby or to extinguish the Indebtedness as of immediately prior to the Closing or (j) direct or indirect guarantees or other contingent Liabilities (including so called "make-whole", "take-or-pay" or "keep-well" agreements) with respect to any indebtedness, obligation, claim or Liability of any other Person of a type described in clauses (a) through (i) above. In addition, the term "Indebtedness" includes all Indebtedness of others secured by a lien on any asset of the specified Person (whether or not such Indebtedness is assumed by the specified Person) and, to the extent not otherwise included, the guarantee by the specified Person of any Indebtedness of any other Person.

"**Intellectual Property**" means any and all intellectual property rights or similar proprietary rights and description throughout the world, whether registered or unregistered, including all rights pertaining to or deriving from: (a) Patents, inventions, invention disclosures, discoveries and improvements, whether or not patentable; (b) trademarks, trade dress, service marks, certification marks, logos, brands, slogans, design rights, names, corporate names, trade names, Internet domain names, social media accounts and addresses and other similar designations of source or origin, together with the goodwill symbolized by any of the foregoing; (c) copyrights and copyrightable subject matter; (d) rights in any computer software or firmware (whether in source code, object code or other form), algorithms, data files, databases, compilations and data technology supporting the foregoing, and all documentation, including user manuals and training materials, related to any of the foregoing; (e) trade secrets (including those trade secrets defined in the Uniform Trade Secrets Act and under corresponding foreign Law), and all other non-public confidential or proprietary information, Know-How, clinical data, non-clinical data, pre-clinical data, in-vitro data, inventions, processes, formulae, models, and methodologies, excluding Patents, and rights to limit the use or disclosure thereof by any Person; and (f) all applications, registrations, and renewals for the foregoing in any jurisdiction throughout the world.

"**Know-How**" means any know-how, trade secret, proprietary invention, discovery, data, information, process, method, technique, material, technology, result or other know-how, whether or not patentable, and all other non-public confidential or proprietary information.

"**knowledge**" means (i) with respect to Seller, the knowledge, within the scope of his or her responsibility assuming reasonable inquiry of those employees known to such persons to have specialized knowledge of the subject matter of the representation and warranty, of the individuals listed in Section 10.01(a) of the Seller Disclosure Letter and (ii) with respect to Buyer, the knowledge, within the scope of his or her responsibility assuming reasonable inquiry of those employees known to such persons to have specialized knowledge of the subject matter of the representation and warranty, of the Chief Legal and Administrative Officer.

"**Law**" means (i) any statute, code, rule, regulation, ordinance, rule of common law, requirement or other pronouncement of any Governmental Entity having the effect of law and (ii) any binding guidance document with regard to drug approval requirements.

"**Liability**" means any debt, Indebtedness, obligation, Tax, duty or liability of any nature (including known, unknown, fixed, absolute, disclosed, undisclosed, matured, unmatured, accrued, unaccrued, asserted, unasserted, determined, determinable, contingent, indirect, conditional, implied, vicarious, derivative, joint, several or secondary liability), regardless of whether such debt, Indebtedness, obligation, Tax, duty or liability would be required to be disclosed on a balance sheet prepared in accordance with GAAP and regardless of whether such debt, obligation, duty or liability is immediately due and payable.

"**Manufacture**" or "**Manufacturing**" shall mean any and all activities related to making, producing, processing, filling, finishing, packaging, labeling or quality assurance testing and releasing of a medicinal product (or any ingredient thereof). Manufacturing shall not include Development or Commercialization.

"**Milestone Event**" means each of the events set forth in Section 1.02(b).

"**Official**" means any official, employee or representative of, or any other person acting in an official capacity for or on behalf of, any (i) Governmental Entity, including any entity owned or controlled thereby, (ii) political party, party official or political candidate, or (iii) public international organization.

"**Orders**" means all orders, rulings, judgments, settlements, arbitration awards or decrees of any Governmental Entity (or any agreement entered into or any administrative, judicial or arbitration award with any Governmental Entity).

"**Ordinary Course**" means the ordinary course of the ownership, operation, Development, Manufacture and Commercialization of the Acquired Assets consistent with past practice.

"**Patents**" means patents, including utility and design patents, patent applications, including provisionals, non-provisionals, utility models and any and all related national or international counterparts thereto, including any divisional, continuation, continuation-in-part applications, reissues, reexaminations, substitutions and extensions thereof (including supplementary protection certificates, requests for, and grants of, continued examination, post-grant confirmations or amendments, counterparts claiming priority from any of the foregoing; and any patents or patent applications that claim priority to or from any of the foregoing) and all rights associated with any of the foregoing, including the right to claim priority arising from or related to any of the foregoing.

"**Permitted Encumbrance**" means: (i) Encumbrances for Taxes, assessments and governmental charts or levies either not yet due and payable or which are being contested in good faith by appropriate proceedings and for which adequate reserves have been established in accordance with GAAP; (ii) Encumbrances incurred in the Ordinary Course for mechanics, carriers', workmen's, warehouseman's, repairmen's, materialmen's or other similar liens that are not yet due and payable or that are being contested in good faith by appropriate proceedings; and (iii) Encumbrances incurred in the Ordinary Course for pledges and deposits to secure the performance of bids, trade Contracts, surety and appeal bonds, performance bonds and other obligations of a similar nature, in each case in the Ordinary Course.

"**Permits**" means any and all federal, state, local and foreign qualifications, permits, registrations, clearances, certificates, rights, applications, submissions, variances, exemptions, filings, approvals and authorizations from Governmental Entities.

"**Person**" means any individual, corporation, limited liability company, partnership, joint venture, estate, trust, association, unincorporated organization, other form of entity, of whatever nature, or Governmental Entity.

"**Post-Closing Tax Period**" means a Tax period that begins after the Closing Date and the portion of a Straddle Period that begins after the Closing Date.

"**Pre-Closing Tax Period**" means a Tax period that ends on or before the Closing Date and the portion of a Straddle Period ending on and including the Closing Date.

"**Proxy Statement**" means a proxy statement to be sent to the stockholders of Seller (together with any amendments or supplements thereto) with respect to the Seller Special Meeting.

"**Regulatory Approval**" means any and all registration, clearance, license permit, approval, concession, variance, waiver, or other authorization of any national, regional, state, or regulatory authority, department, bureau, commission, council or other Governmental Entity that is necessary for any activities in relation to or with a medicinal product in a given country, jurisdiction, or region (including for the Development, Manufacture, supply, and Commercialization of such medicinal product) in such country or jurisdiction.

"**Regulatory Documentation**" means with respect to any Transferred Products, the regulatory documentation, or portion thereof, related to each such product, including (as applicable) all applications for Transferred Registrations and renewals thereof (including investigational new drug applications, orphan designations, new drug applications, abbreviated new drug applications and marketing authorization applications), and the safety reports, information on adverse events, and copies of all correspondence, reports, or minutes with any Governmental Entity, and all data submitted to Governmental Entities in connection with Transferred Registrations, pricing studies, and documents (including, without limitation, laboratory, clinical and pre-clinical animal study data) relating to the Transferred Registrations or to the subject matter of the Transferred Registrations to the extent relating to the Transferred Products. For the avoidance of doubt, Regulatory Documentation shall not include laboratory notebooks, internal audit reports or batch records (other than those batch records contained in Transferred Registrations).

"**Representatives**" means, when used with respect to Buyer or Seller, the directors, officers, employees, consultants, financial advisors, accountants, legal counsel, investment bankers, lenders and other agents, advisors and representatives of Buyer or Seller, as applicable, and their respective Subsidiaries.

"**SEC**" means the United States Securities and Exchange Commission.

"**Securities Act**" means the Securities Act of 1933, as amended.

"**Seller Board Recommendation**" means the recommendation of the Seller Board that the stockholders of Seller vote in favor of approval of the sale of the Acquired Assets pursuant to this Agreement and the transaction contemplated hereby.

"**Seller Intervening Event**" means an Effect that affects or would reasonably be expected to affect the Acquired Assets, taken as a whole, that (a) is material, (b) was not known to the Seller Board as of the date of this Agreement (and which could not have become known through any further reasonable investigation, discussion, inquiry or negotiation with respect to any event, fact, circumstance, development or occurrence known to Seller as of the date of this Agreement), (c) becomes known to the Seller Board prior to obtaining the Seller Stockholder Approval (d) does not relate to or involve any Alternative Transaction and (e) is not the result of a material breach of this Agreement by Seller.

"**Seller Material Adverse Effect**" means any Effect that is materially adverse to (i) the ability of Seller to consummate the transactions contemplated by this Agreement or (ii) the condition (financial or otherwise) or ownership, operation or development of the Acquired Assets, taken as a whole; provided, however, that a "Seller Material Adverse Effect" shall not include, either alone or in combination, any Effect resulting from or arising out of (and the following will not be taken into account when determining whether a "Seller Material Adverse Effect" has occurred): (A) the announcement, pendency or consummation of this Agreement or the transactions contemplated hereby, including the identity of, or any facts or circumstances relating to, Buyer or any of its Affiliates to the extent resulting from the public announcement of this Agreement or the pendency of the transactions contemplated hereby; (B) any action taken by Seller at the written request of Buyer or with Buyer's written consent, or the failure of Seller to take an action that Seller is specifically prohibited from taking by the terms of this Agreement; (C) any event or occurrence generally affecting the industries in which Seller operates relating to the Acquired Assets or in the economy generally or other general business, financial or market conditions; (D) changes affecting the national or international general economic, political, legal or regulatory conditions; (E) changes in Laws after the date hereof applicable to the Acquired Assets; or (F) national or international political conditions or instability, including the engagement by the United States in hostilities, whether or not pursuant to a declaration of emergency or war, or the occurrence of any military or terrorist attack upon the United States or any other nation, except, in each of clauses (C), (D), (E), or (F) above, to the extent such Effects have a disproportionate impact on the Acquired Assets and the Assumed Liabilities, taken as a whole, relative to other Persons owning assets similar to the Acquired Assets, in the industry or markets in which Seller operates.

"**Seller Special Meeting**" means the meeting of the holders of Common Stock for the purpose of seeking the Seller Stockholder Approval, including any postponement or adjournment thereof.

"**Seller Stockholder Approval**" means the affirmative vote of the holders of a majority of the outstanding Common Stock entitled to vote upon the authorization of this Agreement and the transactions contemplated hereby at the Seller Special Meeting.

"**Straddle Period**" means a taxable period that begins before the Closing Date and ends after the Closing Date

"**Subsidiaries**" means all those corporations, associations or other business entities of which the entity in question (a) owns or controls a majority of the outstanding equity securities either directly or through an unbroken chain of entities as to each of which a majority of the outstanding equity securities is owned directly or indirectly by its parent (provided, there shall not be included any such entity the equity securities of which are owned or controlled in a fiduciary capacity), (b) in the case of partnerships, serves as a general partner, (c) in the case of a limited liability company, serves as a managing member, or (d) otherwise has the ability to elect a majority of the directors, trustees or managing members thereof.

"**Superior Proposal**" means any bona fide written proposal made to Seller by any Third Party which did not result from a breach of Section 4.06 with respect to any Alternative Transaction or any purchase or acquisition (a) involving the Acquired Assets or more than 50% of the voting power of the Common Stock, (b) that is on terms that the Seller Board determines in good faith (after consultation with its financial advisors and outside legal counsel) would result in a transaction that, if consummated, is more favorable to Seller's stockholders from a financial point of view than the transactions contemplated by this Agreement (taking into account any proposal by Buyer to amend the terms of this Agreement); (c) with respect to which the cash consideration and other amounts (including costs associated with the proposed acquisition) payable at closing are subject to fully committed financing from recognized financial institutions; and (d) that is reasonably likely to receive all required governmental approvals on a timely basis and otherwise reasonably capable of being completed within a reasonable period of time on the terms proposed, taking into account all financial, regulatory, legal and other aspects of such proposal.

"**Tax Returns**" means all reports, returns, declarations, statements, forms or other information required to be supplied to a Governmental Entity in connection with Taxes, including amendments thereto.

"**Taxes**" means (a) all taxes, including income, gross receipts, capital gain, ad valorem, value-added, goods and services, excise, real property, personal property, sales, use, transfer, withholding, employment and franchise taxes or other similar charges imposed by the United States of America or any state, local or foreign government, or any agency thereof, or other political subdivision of the United States or any such government, and any interest, penalties, assessments or additions to tax resulting from, attributable to or incurred in connection with any tax or any contest or dispute thereof and (b) any liability for any item described in clause (a) of another natural person, corporation, limited liability company, association, partnership, not for profit entity, other form of business, or Governmental Entity, whether by Contract (other than any Contract entered into in the Ordinary Course the principal purpose of which is not related to taxes) or express or implied agreement, pursuant to any applicable Law, as a transferee or successor, or otherwise.

"**Third Party**" means any Person other than the Parties or any of their respective Subsidiaries and Affiliates.

"**Transaction Litigation**" means any claim or legal proceeding (including any class action or derivative litigation) not involving a Governmental Entity asserted or commenced by, on behalf of or in the name of, against or otherwise involving Seller and/or any of its directors or officers relating directly or indirectly to this Agreement, the sale of the Acquired Assets or any of the other transactions contemplated by this Agreement (including any such claim or legal proceeding based on allegations that Seller's entry into the Agreement or the terms and conditions of the Agreement constituted a breach of the fiduciary duties of Seller's Board or any officer of Seller).

"**Transferred Inventory**" means all inventory of Transferred Products and reference standards, retains and intermediates related thereto, ingredients and any other raw materials, work-in-progress materials, package inserts, packaging and labeling materials, supplies and other inventories used in the manufacturing or production of any Transferred Products, but specifically excluding such quantity of CTP-656 as may be required by Seller prior to Closing in the Ordinary Course, including material required for Seller to support and conduct its clinical trials.

"**Transferred Know-How**" means Know-How (other than DCE Platform Know-How) that is necessary or useful for the ownership, Development, Manufacture and Commercialization of the CF Enterprise.

"**Transferred Products**" means (i) all deuterated ivacaftor, including the deuterated form of ivacaftor having a chemical formula as set forth on Section 10.01(b) of the Seller Disclosure Letter, including the compound coded by Seller as CTP-656, and (ii) any other compounds used, planned for use or held for use, in each case, in the ownership, operation or conduct of the CF Enterprise (including deuterated tezacaftor) as of the date hereof and the Closing Date, in each of cases (i) and (ii), including any derivatives, combinations, or other forms thereof; provided, that compounds that are (a) solely intended for use as a treatment of antibacterial infections in patients with cystic fibrosis or (b) listed on Section 10.01(c) of the Seller Disclosure Letter shall not be considered Transferred Products.

"**Transferred Product Records**" (i) written records lab notebooks, accounts, notes, reports, batch records and data, (ii) Regulatory Documentation, (iii) Development data (of any kind) from discovery through to submission (raw data, stability, validation, quality by design work), all analytical methods development and validation, (iv) Manufacturing data (of any kind), batch records, Manufacturing facility, quality control lab commissioning, validation protocols, testing protocols, and reports, (v) facility and equipment detailed drawings, all equipment maintenance and calibration data, and (vi) records relating to the filing, prosecution, issuance, maintenance, enforcement or defense of the Transferred IP, in the case of clauses (i) - (vi) that are owned or controlled by or otherwise in the possession of Seller as of the Closing Date and related to the Transferred Products.

"**Transferred Registrations**" any and all Regulatory Approvals granted or issued by, or applied for to a national, regional, state, or regulatory authority, department, bureau, commission, council or other Governmental Entity for any activities in relation to or with a medicinal product in a given country, jurisdiction, or region (including for the Development, Manufacture, supply, and Commercialization of such medicinal product).

Section 10.02 **Terms Defined Elsewhere**. The following terms are defined elsewhere in this Agreement, as indicated below:

Acquired Assets	Section 1.01(a)
Acquired Assets Permits	Section 2.12(a)
Acquired Assets Regulatory Filings	Section 2.12(a)
Aggregate Threshold	Section 6.05(b)(ii)
Agreed Amount	Section 6.04(b)
Agreement	Preamble
Antitrust Approvals	Section 4.03(b)
Assigned Contracts	Section 1.01(a)(iv)
Assigned IP Contracts	Section 1.01(a)(iv)
Assumed Liabilities	Section 1.01(d)
Assumption Agreements	Section 1.01(d)
Bill of Sale	Section 1.03(b)(iii)
Burdensome Term or Condition	Section 4.03(f)

Buyer	Preamble
Buyer FDA Letter	Section 5.03(e)
Buyer Group	Section 1.01(a)
Buyer Indemnified Parties	Section 6.02
Buyer Orphan Designation Letter	Section 5.03(e)
Cap	Section 6.05(b)(i)
CF Enterprise	Recitals
Claim Notice	Section 6.04(b)
Claimed Amount	Section 6.04(b)
Closing	Section 1.03(a)
Closing Date	Section 1.03(a)
Confidentiality Agreement	Section 4.02
Contingent Payment	Section 1.02(b)
CTAs	Section 2.10(a)(viii)
DOJ	Section 4.03(a)
Electronic Delivery	Section 10.07
Excluded Assets	Section 1.01(b)
Excluded Liabilities	Section 1.01(e)
FDA	Section 2.12(a)
FDCA	Section 2.12(a)
FTC	Section 4.03(a)
Fundamental Representations	Section 6.01(a)
Guarantor	Preamble
HSR Act	Section 2.05(c)
Indemnified Party	Section 6.04(a)
Indemnifying Party	Section 6.04(a)
IP Assignment Agreements	Section 1.03(b)(iv)
Material Contract	Section 2.10(a)
MTAs	Section 2.10(a)(viii)
NDAs	Section 2.10(a)(viii)
Non-Compete Period	Section 9.05(a)
Outside Date	Section 7.01(f)(ii)
Parties	Preamble
Party	Preamble
PHSA	Section 2.12(a)
Pre-Closing Period	Section 4.01(a)
Research and Testing Agreement	Recitals
Registered Business IP	Section 2.09(a)
Regulatory Authority	Section 2.12(a)
Regulatory Filings	Section 4.03(a)
Related Agreements	Section 2.03
Restricted Names	Section 9.02
Safety Notice	Section 2.12(d)
Seller	Preamble
Seller Board	Section 2.03
Seller Board Approval	Section 2.20
Seller Change of Recommendation	Section 4.07(c)
Seller Disclosure Letter	Article II
Seller FDA Letter	Section 5.02(f)
Seller Indemnified Parties	Section 6.03

Section 10.03 **Press Releases and Announcements**. Each Party shall consult with the other Party and give the other Party a reasonable opportunity to comment on such Party's press release announcing the execution and delivery of this Agreement. No Party shall issue (and each Party shall cause its Affiliates not to issue) any press release or public disclosure relating to the subject matter of this Agreement, or its terms, without the prior written approval of the other Party; provided, however, that nothing in this Section 10.03 shall prevent any Party from (a) making any public disclosure it believes in good faith is required by Law, regulation or stock exchange rule (in which case the disclosing Party shall use its commercially reasonable efforts to advise the other Party prior to making disclosure and the other Party shall have the right to review such press release or announcement prior to its publication) or (b) enforcing its rights hereunder.

Section 10.04 **No Third Party Beneficiaries**. Except as provided by applicable Law, this Agreement shall not confer any rights or remedies upon any Person other than each Party and its respective successors and permitted assigns and, to the extent specified herein, its respective Affiliates; provided, however, that the provisions of Article VI and Article VII are intended for the benefit of the entities and individuals specified therein and their respective legal representatives, successors and assigns.

Section 10.05 **Entire Agreement**. This Agreement (including the documents referred to herein), the Related Agreements, the Confidentiality Agreement and the Escrow Agreement constitute the entire agreement between the Parties with respect to the subject matters hereof and thereof and supersede all other prior agreements (except that the Confidentiality Agreement shall be deemed amended hereby so that until the termination of this Agreement in accordance with Section 7.01, Buyer shall be permitted to take the actions contemplated by this Agreement) and understandings, both written and oral, between the Parties or any of them with respect to the subject matter hereof and thereof.

Section 10.06 **Succession and Assignment**. This Agreement shall be binding upon and inure to the benefit of and be enforceable by each of the Parties named herein and its respective successors and permitted assigns. No Party may assign either this Agreement or any of its rights, interests, or obligations hereunder (whether by operation of Law or otherwise) without the prior written consent of the other Party; provided, that (i) Seller may assign all of its rights and obligations hereunder to any successor or assign of Seller's business through the acquisition (whether by operation of Law or otherwise) of more than 50% of the voting power of Common Stock and/or substantially all of Seller's assets and (ii) Buyer may assign the right to acquire certain of the Acquired Assets to one or more of its Affiliates prior to the Closing (provided, that in connection with any such assignment, Buyer shall remain primarily liable for such assigned obligations); provided, however, following the Closing, Buyer may assign and delegate, in whole or in part, its rights and obligations hereunder to either (i) a wholly-owned Subsidiary of Buyer, (ii) an Affiliate under common control with Buyer or (iii) in connection with the transfer by Buyer of all or substantially all of the Acquired Assets; and provided, further, however, that no such assignment shall relieve Buyer of any obligation or liability under this Agreement.

Section 10.07 **Counterparts**. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but both of which together shall constitute one and the same instrument. This Agreement may be executed and delivered by e-mail of a .pdf, .tif, .jpeg or similar attachment ("**Electronic Delivery**"), and any such counterparty delivered using Electronic Delivery shall be treated in all manner and respects as an original executed counterpart and shall be considered to have the same binding legal effect as if it were the original signed version thereof delivered in person.

Section 10.08 **Notices**. All written notices that are required or permitted hereunder will be in writing and sufficient if delivered personally or sent by nationally-recognized overnight courier, addressed as follows:

if to Buyer, to:

Vertex Pharmaceuticals Incorporated
Attention: Business Development
50 Northern Avenue
Boston, MA 02110

with a copy (which shall not constitute notice) to:

Vertex Pharmaceuticals Incorporated
Attention: Corporate Legal
50 Northern Avenue
Boston, MA 02110
Email: Legal_Notice@vrtx.com

and

White & Case LLP
1155 Avenue of the Americas
New York, New York 10036

Attn: Daniel G. Dufner, Jr., Esq.
Michael A. Deyong, Esq.
Email: daniel.dufner@whitecase.com
michael.deyong@whitecase.com

If to Seller, to:

Concert Pharmaceuticals, Inc.
99 Hayden Avenue, Suite 500
Lexington, MA 02421
Attn: Chief Executive Officer and General Counsel
Email: rtung@concertpharma.com
rsilverman@concertpharma.com

with a copy (which shall not constitute notice) to:

Goodwin Procter LLP
100 Northern Ave

Boston, MA 02210

Attn: John M. Mutkoski, Esq.
Andrew H. Goodman, Esq.

Email: JMutkoski@goodwinlaw.com
AGoodman@goodwinlaw.com

or to such other address as the Party to whom written notice is to be given may have furnished to the other Party in writing in accordance herewith. Any such written notice will be deemed to have been given and received by the other Party: (a) when delivered if personally delivered; or (b) on receipt if sent by overnight courier.

Section 10.09 **Governing Law; Jurisdiction**. This Agreement shall be governed by, and construed in accordance with, the Laws of the State of Delaware, without giving effect to conflicts of laws principles that would result in the application of the Law of any other state. Each of the Parties hereto hereby irrevocably and unconditionally submits, for itself and its property, to the exclusive jurisdiction of the Court of Chancery of the State of Delaware, or, if such court finds it lacks subject matter jurisdiction, the federal court of the United States of America sitting in Delaware, and any appellate court from any thereof, in any suit, action, legal proceeding or claim arising out of or relating to this Agreement or the agreements delivered in connection herewith or the transactions contemplated hereby or thereby or for recognition or enforcement of any judgment relating thereto, and each of the Parties hereby irrevocably and unconditionally (i) agrees not to commence any such suit, action, legal proceeding or claim except in the Court of Chancery of the State of Delaware, or, if such court finds it lacks subject matter jurisdiction, the federal court of the United States of America sitting in Delaware, and any appellate court from any thereof, (ii) agrees that any claim in respect of any such suit, action, legal proceeding or claim may be heard and determined in the Court of Chancery of the State of Delaware, or, if such court finds it lacks subject matter jurisdiction, the federal court of the United States of America sitting in Delaware, and any appellate court from any thereof, (iii) waives, to the fullest extent it may legally and effectively do so, any objection that it may now or hereafter have to the laying of venue of any such suit, action, legal proceeding or claim in such courts and (iv) waives, to the fullest extent permitted by Law, the defense of an inconvenient forum to the maintenance of such suit, action, legal proceeding or claim in such courts. Each of the Parties hereto (A) agrees that a final judgment in any such suit, action, legal proceeding or claim shall be conclusive and may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by Law and (B) waives any objection to the recognition and enforcement by a court in other jurisdictions of any such final judgment. Each Party to this Agreement irrevocably consents to service of process inside or outside the territorial jurisdiction of the courts referred to in this Section 10.09 in the manner provided for notices in Section 10.08. Nothing in this Agreement will affect the right of any Party to this Agreement to serve process in any other manner permitted by Law.

Section 10.10 **Amendments and Waivers**. The Parties may mutually amend or waive any provision of this Agreement at any time. No amendment or waiver of any provision of this Agreement shall be valid unless the same shall be in writing and signed by each of the Parties. No waiver by either Party of any default, misrepresentation, or breach of warranty or covenant hereunder, whether intentional or not, shall be deemed to extend to any prior or subsequent default, misrepresentation or breach of warranty or covenant hereunder or affect in any way any rights arising by virtue of any prior or subsequent such occurrence. No failure or delay by any Party in exercising any right, power or privilege hereunder shall operate as a waiver thereof.

Section 10.11 **Severability**. Any term or provision of this Agreement that is invalid or unenforceable in any situation in any jurisdiction shall not affect the validity or enforceability of the remaining terms and provisions hereof or the validity or enforceability of the offending term or provision in any other situation or in any other jurisdiction. If the final judgment of a court of competent jurisdiction declares that any term or provision hereof is invalid or unenforceable, the Parties agree that the body making the determination of invalidity or unenforceability shall have the power to reduce the scope, duration or area of the term or provision, to delete specific words or phrases, or to replace any invalid or unenforceable term or provision with a term or provision that is valid and enforceable and that comes closest to expressing the intention of the invalid or unenforceable term or provision, and this Agreement shall be enforceable as so modified after the expiration of the time within which the judgment may be appealed.

Section 10.12 **Expenses**. Except as otherwise specifically provided to the contrary in this Agreement or any of the Related Agreements, each of the Parties shall bear its own costs and expenses (including legal fees and expenses) incurred in connection with this Agreement and the transactions contemplated hereby, whether or not the Closing takes place.

Section 10.13 **Specific Performance**. Each Party acknowledges and agrees that the other Party would be damaged irreparably in the event any of the provisions of this Agreement are not performed in accordance with their specific terms or otherwise are breached or are threatened to be breached, and that money damages or other legal remedies would not be an adequate remedy for any such damages. It is accordingly agreed that prior to the valid termination of this Agreement in accordance with Section 7.01, (i) the Parties shall be entitled to seek (in a court of competent jurisdiction as set forth in Section 10.09) an injunction or injunctions to prevent breaches of this Agreement and to enforce specifically the terms and provisions of this Agreement (including Buyer's obligation to effect the Closing), without bond or other security being required, this being in addition to any remedy to which they are entitled under this Agreement, and (ii) the right of specific enforcement is an integral part of the transactions contemplated by this Agreement and without that right, neither Seller nor Buyer would have entered into this Agreement. Without limiting the generality of the foregoing, it is explicitly agreed that Seller shall be entitled to an injunction, specific performance or other equitable remedy to specifically enforce Buyer's obligation to effect the Closing on the terms and conditions set forth herein in the event that all conditions in Sections 5.01 and 5.02 have been satisfied (other than those conditions that by their nature are to be satisfied by actions taken at the Closing, each of which is then capable of being satisfied at a Closing on such date) at the time when the Closing would have occurred but for the failure of Buyer to comply with its obligations to effect the Closing pursuant to the terms of this Agreement. Each of Seller and Buyer acknowledges and agrees that following a valid termination of this Agreement in accordance with Section 7.01, each Party shall be entitled to seek monetary damages for a willful or intentional breach of this Agreement in accordance with Section 7.02(a).

Section 10.14 **Guaranty**. Guarantor irrevocably guarantees each and every covenant and obligation of Buyer and the full and timely performance of Buyer's obligations under the provisions of this Agreement. This is a guaranty of payment and performance, and not of collection, and Guarantor acknowledges and agrees that this guaranty is full and unconditional, and no release or extinguishments of Buyer's Liabilities (other than in accordance with the terms of this Agreement), whether by decree in any bankruptcy proceeding or otherwise, will affect the continuing validity and enforceability of this guaranty. Guarantor hereby waives, for the benefit of Seller, (i) any right to require Seller as a condition of payment or performance of Guarantor to proceed against Buyer or pursue any other remedies whatsoever and (ii) to the fullest extent permitted by Law, any defenses or benefits that may be derived from or afforded by Law that limit the liability of or exonerate guarantors or sureties, except to the extent that any such defense is available to Buyer. Guarantor understands that Seller is relying on this guaranty in entering into this Agreement. Under no circumstances shall the maximum amount payable by

Guarantor hereunder for any reason and under any legal theory in law or at equity exceed an amount equal to the Base Purchase Price and any Contingent Payment that becomes payable pursuant to Section 1.02(b).

Section 10.15 Construction. Except where expressly stated otherwise in this Agreement, the following rules of interpretation apply to this Agreement: (a) "either" and "or" are not exclusive and "include", "includes" and "including" are not limiting; (b) "hereof", "hereto", "hereby", "herein" and "hereunder" and words of similar import when used in this Agreement refer to this Agreement as a whole and not to any particular provision of this Agreement; (c) the word "will" shall be construed to have the same meaning as the word "shall"; (d) "extent" in the phrase "to the extent" means the degree to which a subject or other thing extends, and such phrase does not mean simply "if"; (e) definitions contained in this Agreement are applicable to the singular as well as the plural forms of such terms; (f) references to any Law, Contract, instrument or other document shall mean such Law, Contract, instrument or other document as amended, supplemented or otherwise modified from time to time, including by succession of comparable successor Laws; (g) references to a person or entity are also to its permitted successors and assigns; (h) references to an "Article", "Section", "Exhibit", "Annex" or "Schedule" refer to an Article or Section of, or an Exhibit, Annex or Schedule to, this Agreement; (i) references to "$" or otherwise to dollar amounts refer to the lawful currency of the United States; (j) unless the context so requires, references to any Laws or specific provisions of Laws shall include any rules, regulations and delegated legislation issued thereunder; (k) references to any pronoun shall include the corresponding masculine, feminine and neuter forms; (l) the table of contents and headings set forth in this Agreement are for convenience of reference purposes only and shall not affect or be deemed to affect in any way the meaning or interpretation of this Agreement or any term or provision hereof; and (m) references herein to "primarily" shall include "primarily" as well as any other standard that reflects a majority or more of the matter addressed, including "exclusively" or any similar term. Whenever this Agreement refers to a number of days, such number shall refer to calendar days unless Business Days are specified, and if any action is to be taken or given on or by a particular calendar day, and such calendar day is not a Business Day, then such action may be deferred until the next Business Day. The language used in this Agreement shall be deemed to be the language chosen by the Parties hereto to express their mutual intent, and no rule of strict construction shall be applied against either Party. The Parties agree that they have been represented by counsel during the negotiation and execution of this Agreement and, therefore, waive the application of any Law, regulation, holding or rule of construction providing that ambiguities in an agreement or other document will be construed against the Party drafting such agreement or document.

Section 10.16 Waiver of Jury Trial. EACH PARTY HEREBY IRREVOCABLY AND UNCONDITIONALLY WAIVES ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY LEGAL PROCEEDING DIRECTLY OR INDIRECTLY ARISING OUT OF OR RELATING TO THIS AGREEMENT AND ANY OF THE AGREEMENTS DELIVERED IN CONNECTION HEREWITH AND THE TRANSACTIONS CONTEMPLATED HEREBY. EACH PARTY CERTIFIES AND ACKNOWLEDGES THAT (A) NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE EITHER OF SUCH WAIVERS, (B) IT UNDERSTANDS AND HAS CONSIDERED THE IMPLICATIONS OF SUCH WAIVERS, (C) IT MAKES SUCH WAIVERS VOLUNTARILY, AND (D) IT HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION 10.15.

[*Remainder of page intentionally left blank*]

The Parties hereto have executed this Agreement as of the date first above written.

CONCERT PHARMACEUTICALS, INC.

By: /s/Roger Tung
Name: Roger Tung
Title: President & CEO

VERTEX PHARMACEUTICALS (EUROPE) LIMITED

By: /s/Ian Smith
Name: Ian Smith
Title: Director

Solely with respect to Section 10.14 herein:

VERTEX PHARMACEUTICALS INCORPORATED

By: /s/Ian Smith
Name: Ian Smith
Title: Executive Vice President, Chief Operating Officer and Chief Financial Officer

Exhibit A

Form of Assumption Agreement

[Attached]

Exhibit B

Form of Bill of Sale

[Attached]

Exhibit C

Form of IP Assignment Agreement

[Attached]

Exhibit D

Form of Transition Services Agreement

Exhibit E-1

Form of Seller FDA Letter

[Attached]

Exhibit E-2

Form of Seller Orphan Designation Letter

[Attached]

Exhibit F-1

Form of Buyer FDA Letter

[Attached]

Exhibit F-2

Form of Buyer Orphan Designation Letter

[Attached]

Exhibit G

Form of Escrow Agreement

[Attached]

Exhibit 10.22

SUMMARY OF DIRECTOR COMPENSATION PROGRAM

The board of directors (the " Board ") of Concert Pharmaceuticals, Inc. (the " Company ") has approved the following director compensation program. Under this director compensation program, the Company will pay its non-employee directors retainers in cash. Each non-employee director will receive a cash retainer for service on the Board and for service on each committee of which the director is a member. The chairmen of the Board and of each committee will receive higher retainers for such service. These fees are payable quarterly in arrears. The fees paid to non-employee directors for service on the Board and for service on each committee of the Board of which the director is a member are as follows:

	Member Annual Fee	Chairman Annual Fee
Board of Directors	35,000	65,000
Audit Committee	7,500	15,000
Compensation Committee	5,000	10,000
Nominating and Corporate Governance Committee	3,000	7,000

The Company will also reimburse its non-employee directors for reasonable travel and out-of-pocket expenses incurred in connection with attending Board and committee meetings.

In addition, under the Company's director compensation program, each non-employee director elected to the Board after the closing of the Company's initial public offering will receive an option to purchase 25,000 shares of the Company's common stock. Each of these options will vest in equal quarterly installments over a three-year period measured from the date of grant, subject to the director's continued service as a director, and will become exercisable in full upon a change in control of the Company. Further, on the date of the first Board meeting held after each annual meeting of stockholders, each non-employee director that has served on the Board for at least six months will receive an option to purchase 10,000 shares of the Company's common stock. Each of these options will vest in equal quarterly installments over a one-year period measured from the date of grant, subject to the director's continued service as a director, and will become exercisable in full upon a change in control of the Company. The exercise price of these options will equal the fair market value of the Company's common stock on the date of grant.

Exhibit 21.1

Subsidiaries of the Registrant

Name	Jurisdiction of Organization
Concert Pharmaceuticals Securities Corporation	Massachusetts
Concert Pharma U.K. Ltd	United Kingdom

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statement (Form S-3 No. 333-202451) of Concert Pharmaceuticals, Inc. and the related Prospectus, the Registration Statement (Form S-8 No. 333-195125) pertaining to the Amended and Restated 2006 Stock Option and Grant Plan and 2014 Stock Incentive Plan of Concert Pharmaceuticals, Inc., the Registration Statement (Form S-8 No. 333-202453) pertaining to the 2014 Stock Incentive Plan of Concert Pharmaceuticals, Inc., and the Registration Statement (From S-8 No. 333-209841) pertaining to the 2014 Stock Incentive Plan of Concert Pharmaceuticals, Inc., of our report dated March 6, 2017, with respect to the consolidated financial statements of Concert Pharmaceuticals, Inc. included in this Annual Report (Form 10-K) for the year ended December 31, 2016.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 6, 2017

Exhibit 31.1

**CERTIFICATION PURSUANT TO RULE 13a-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Roger D. Tung, certify that:

1. I have reviewed this Annual Report on Form 10-K of Concert Pharmaceuticals, 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(s) 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(s) 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 6, 2017

/s/ Roger D. Tung

Roger D. Tung
President and Chief Executive Officer

Exhibit 31.2

**CERTIFICATION PURSUANT TO RULE 13a-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Ryan Daws, certify that:

1. I have reviewed this Annual Report on Form 10-K of Concert Pharmaceuticals, 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(s) 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(s) 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 6, 2017

/s/ Ryan Daws

Ryan Daws
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Concert Pharmaceuticals, Inc. (the "Company") for the year ended December 31, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Roger D. Tung, President and Chief Executive Officer of the Company, hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(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.

Dated: March 6, 2017

/s/ Roger D. Tung
Roger D. Tung
President and Chief Executive Officer

A signed original of this written statement required by Section 906 has been provided to Concert Pharmaceuticals, Inc. and will be retained by Concert Pharmaceuticals, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K of Concert Pharmaceuticals, Inc. (the "Company") for the year ended December 31, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Ryan Daws, Chief Financial Officer of the Company, hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(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.

Dated: March 6, 2017

/s/ Ryan Daws
Ryan Daws
Chief Financial Officer

A signed original of this written statement required by Section 906 has been provided to Concert Pharmaceuticals, Inc. and will be retained by Concert Pharmaceuticals, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.