

# CONCERT PHARMACEUTICALS, INC.

## FORM 10-K (Annual Report)

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**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, 2014

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**  
(State or other jurisdiction of  
incorporation or organization)

**20-4839882**  
(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:**

<u>Title of each class</u>	<u>Name of each exchange on which registered</u>
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	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/> (Do not check if a smaller reporting company)	Smaller reporting company	<input type="checkbox"/>

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, 2014 was approximately \$98,050,000, 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 23, 2015: 18,286,539

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### 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. Our approach starts with 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, thereby enhancing clinical safety, tolerability or efficacy. We believe our approach may enable drug discovery and clinical development that is more efficient and less expensive than conventional small molecule drug research and development.

We have a robust pipeline of wholly owned and collaboration programs. We currently have five clinical candidates that have the potential to address important medical needs.

The following summarizes our clinical development programs:

- AVP-786 is a combination of a deuterium-substituted dextromethorphan analog and an ultra-low dose of quinidine being investigated for treatment of neurologic and psychiatric disorders. We granted Avanir Pharmaceuticals, Inc., or Avanir, a worldwide license to develop and commercialize deuterated dextromethorphan analogs, including the analog in AVP-786. Subsequent to our agreement, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. Avanir is conducting a Phase 2 clinical trial of AVP-786 as an adjunctive treatment for major depressive disorder and also has announced plans to advance AVP-786 into Phase 3 testing for agitation associated with Alzheimer's disease, following agreement with the United States Food and Drug Administration, or FDA.
- CTP-499 is a novel, potential first-in-class treatment for diabetic nephropathy that we are developing as an additive treatment to the current standard of care. We have completed a Phase 2 clinical trial and plan to seek one or more collaborators for future development of CTP-499 in diabetic nephropathy.
- CTP-354 is a novel, potential first-in-class, non-sedating treatment for spasticity that we are initially developing for use in patients with spinal cord injury and in patients with multiple sclerosis to address a significant unmet medical need in these markets. We have conducted Phase 1 clinical trials and intend to conduct additional non-clinical studies prior to initiating Phase 2 clinical testing.
- CTP-730 is a product candidate for the treatment of inflammatory diseases that is being developed under a worldwide collaboration with Celgene Pharmaceuticals, Inc., Celgene International Sarl and Celgene Corporation, together referred to as Celgene, to research, develop and commercialize certain deuterated compounds for the treatment of inflammation or cancer. In September 2014, we announced the initiation of a Phase I clinical program with a single ascending dose clinical trial designed to assess the safety, tolerability and pharmacokinetics of CTP-730. The Phase 1 clinical program is designed to also evaluate multiple ascending doses of CTP-730 and is expected to be completed in 2015.
- JZP-386 is a product candidate containing a deuterated analog of sodium oxybate for the potential treatment of narcolepsy. We have granted Jazz Pharmaceuticals Ireland Limited, or Jazz Pharmaceuticals, worldwide rights to develop and commercialize deuterated sodium oxybate compounds, including JZP-386. Sodium oxybate is the active ingredient in Jazz Pharmaceuticals' marketed drug Xyrem<sup>®</sup>. A second Phase 1 clinical trial evaluating JZP-386 was initiated in the first quarter of 2015, with data expected in the second quarter of 2015 which will inform the next steps in the development of the program.

Our DCE Platform<sup>®</sup>, or deuterated chemical entity platform, comprises the proprietary know-how, techniques and information that we have accumulated since our inception in 2006, enables us to efficiently identify compounds for deuteration and to design, evaluate, develop and manufacture deuterated compounds. We are utilizing our DCE Platform to discover and develop product candidates for a variety of indications.

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We believe that our application of deuterium chemistry to substitute deuterium for hydrogen, which we refer to as deuteration, is an efficient way to build on existing knowledge to create important new medicines. Deuterium is similar to hydrogen in size and shape. However, deuterium differs from hydrogen in one pharmaceutically important respect—deuterium forms a more stable chemical bond with carbon. This increased stability has the potential, through the selective substitution of deuterium for hydrogen, to improve pharmacokinetic and metabolic properties without changing a compound's intrinsic biological activity.

In our drug discovery and development processes, we build on existing information regarding the corresponding non-deuterated compound. This allows us to efficiently identify lead compounds and, in some cases, shorten the amount of time necessary to initiate clinical trials as compared to conventional small molecule drug research and development. In clinical development, we believe that the FDA and comparable foreign regulatory authorities may allow some of our compounds that are deuterated analogs of approved products, or of compounds for which approval is pending, to follow an expedited development pathway by relying on previous clinical and preclinical data related to the non-deuterated compound. For example, in June 2013, Avanir reported that the FDA agreed to an expedited development pathway for AVP-786, permitting Avanir to reference data from its development of dextromethorphan and quinidine in its Investigational New Drug application, or IND, and any future New Drug Application, or NDA, for AVP-786.

## OUR STRATEGY

Our strategy is to apply our extensive knowledge of deuterium chemistry to discover, develop and commercialize novel small molecule drugs. Key components of our strategy include:

- *Rapidly advancing our deuterated product candidates*. We seek to reduce the time and cost associated with conventional small molecule drug research and development by capitalizing on the known activity, safety, efficacy or development history of the non-deuterated analogs of our product candidates. Leveraging this knowledge, we have been able in a number of our programs, including CTP-499, to advance compounds from initial synthesis to clinical evaluation in less than two years. We also seek to develop product candidates that may be eligible for an expedited development or regulatory pathway, such as reported by Avanir for AVP-786.
- *Efficiently assessing deuterium effects in Phase 1 clinical trials*. We believe that important attributes of our compounds, in particular deuterium analogs of approved drugs with well-understood efficacy parameters, can be assessed quickly and with limited investment in Phase 1 trials. We will seek to rapidly move into Phase 1 trials with our deuterium-modified compounds to assess the magnitude of deuterium effects.  
*Establishing collaborations to develop and commercialize deuterated product candidates*. Our current collaborations are focused on deuterated analogs of one or more of our collaborators' proprietary compounds. In these situations, we benefit from our collaborators' knowledge and experience with, and rights of reference to regulatory filings for, their corresponding non-deuterated compounds. We may establish similar collaborations in the future and also plan to enter into other collaborations to access the resources of larger biopharmaceutical companies.
- *Capitalizing on our DCE Platform to build a robust pipeline of additional deuterated product candidates*. Our DCE Platform consists of our proprietary know-how, techniques and information. We broadly apply our DCE Platform to approved drugs, advanced clinical candidates or previously studied compounds. We particularly look to initiate development programs in areas of significant medical need and commercial opportunity. We believe we are capable of identifying one to two novel deuterated compounds per year that we can advance into preclinical and early clinical development while concurrently progressing our existing pipeline.
- *Retaining commercialization rights on a selective basis and building a specialized commercialization capability in the United States*. We plan to use a combination of third party collaborations and licensing and distribution arrangements and a focused in-house commercialization capability to sell any of our products that receive marketing approval. For the United States, we plan to seek to retain full commercialization

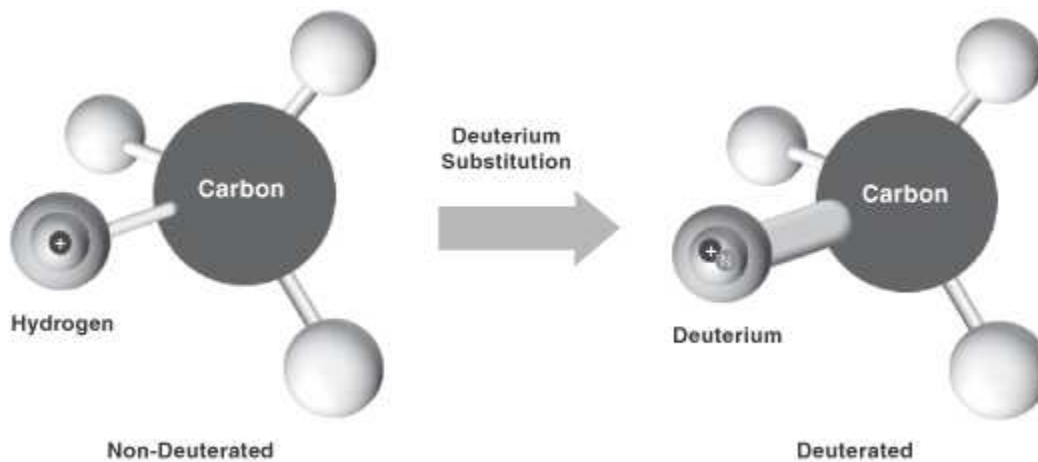
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rights for products that we can commercialize with a specialized sales force and to retain co-promotion or similar rights, when feasible, in indications requiring a larger commercial infrastructure. We plan to collaborate with other parties for commercialization outside the United States.

- *Expanding our broad patent estate covering deuterated compounds and related technology.* Since our inception in 2006, we have systematically sought, and continue to seek, to identify compounds that can be improved through selective deuterium substitution and to obtain patent protection for deuterated analogs of these compounds with the goal of establishing a broad proprietary position in this field. We hold issued U.S. patents covering the composition of matter of each of our most advanced product candidates. In addition, we own issued patents or patent applications that claim the deuterated analogs of more than 90 non-deuterated compounds.

## DEUTERIUM: IMPLICATIONS FOR DRUG RESEARCH AND DEVELOPMENT

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.

## OUR DCE PLATFORM

Our DCE Platform consists of the proprietary know-how, techniques and information that we have developed since our inception in 2006. Deuterated compounds can have an increased half-life in the body and increased systemic exposure as compared to their corresponding non-deuterated analogs, which we believe can lead to benefits such as improved safety, efficacy, tolerability and convenience. Due to our significant experience in

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deuterium chemistry and pharmaceutical research and development, we believe we are well-positioned to efficiently identify compounds that can benefit from deuterium substitution and create optimally deuterated product candidates.

We believe that our DCE Platform can enable drug discovery and clinical development that is more efficient and less expensive than conventional small molecule drug research and development. Conventional drug discovery and development are lengthy processes with high failure rates. Relatively few molecules identified in drug discovery possess the beneficial pharmacological activity and acceptable tolerability and toxicity required to become clinically useful medicines that address commercially important needs. We believe that our product candidates may have a higher likelihood of becoming useful medicines because we selectively deuterate molecules that are already known to be pharmacologically active *in vivo* and have either been studied in humans or are closely chemically related to such molecules. We believe that our likelihood of success may be even greater in cases in which we have selectively deuterated analogs of approved drugs.

Our DCE Platform includes the following capabilities, which we believe provide us with key competitive advantages:

*Selection of attractive compounds for deuteration.* We identify candidate compounds for selective deuteration through the efforts of a team that integrates chemistry, biology, medical, regulatory, intellectual property and commercial expertise. We believe our ability to choose appropriate candidate molecules for selective deuteration is an important competitive advantage. We apply our experience and know-how to 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, tolerability or efficacy. We prioritize candidate compounds based on medical need, commercial opportunity and competitive and patent landscapes. We believe that we are capable of identifying one to two novel deuterated compounds per year that we can advance into preclinical development while concurrently progressing our existing pipeline.

*Medicinal chemistry and chemical and biological testing of deuterated compounds.* We have developed significant proprietary know-how in the design, synthesis, chemical analysis, bioanalytical assessment, preclinical evaluation and clinical development of deuterated compounds. Our know-how includes the ability to:

- synthesize a wide range of chemical compounds that incorporate deuterium selectively at specific positions and accurately analyze deuterium content at those positions;
- identify, through an efficient, iterative process, the deuterated compounds that possess improved *in vitro* or *in vivo* metabolic or pharmacokinetic properties relative to the corresponding non-deuterated compound;
- develop and apply bioanalytical methods to identify and measure metabolites formed by the *in vitro* and *in vivo* metabolism of deuterated compounds; and
- understand how the effects of selective deuterium substitution may translate from *in vitro* to *in vivo* systems and from non-human models to humans.

*Manufacturing of deuterated compounds.* By applying our manufacturing and analytical know-how and capabilities, we are able to reproducibly manufacture deuterated compounds. Our manufacturing capabilities include the ability to:

- manufacture, analyze and formulate deuterated compounds that can be used in early stage clinical trials;
- manufacture low kilogram quantities of deuterated active pharmaceutical ingredients and product candidates suitable for early stage clinical trials;
- transfer our methods to manufacturing vendors that can produce multi-kilogram quantities of clinical trial materials; and
- utilize a supply chain that we have built with multiple vendors that can provide deuterium reagents and intermediates in commercial scale quantities.



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### Development opportunities using our DCE Platform

We apply our DCE Platform to create deuterated analogs of:

- marketed drugs for their approved indications or compounds in clinical development for their targeted indications;
- marketed drugs for non-approved indications or compounds in clinical development for indications that were not previously targeted; and
- previously studied compounds, or close analogs thereof, that were not, or are no longer being, developed.

### Potential advantages of product candidates based on our DCE Platform

We apply our DCE Platform to systematically identify approved drugs, advanced clinical candidates or previously studied compounds for which we believe we can improve or create clinical benefit through deuterium substitution. Potential advantages of our selective deuteration include:

- *Improved metabolic profile.* We have selectively deuterated compounds and compounds produced by metabolism of other compounds, which are called metabolites, to improve their metabolic profiles by reducing the formation of toxic or reactive metabolites or by increasing the formation of desired, active metabolites relative to the corresponding non-deuterated compound. The improved metabolic profile may potentially reduce or eliminate unwanted side effects or undesirable drug interactions. For example, Avanir has reported that, compared to dextromethorphan, the deuterated dextromethorphan in AVP-786 required less quinidine, a metabolic inhibitor, to achieve desired clinical blood levels in a Phase 1 clinical trial.
- *Improved oral bioavailability.* We have selectively deuterated compounds to reduce the extent of undesired metabolism in the wall of the intestines and in the liver, referred to as first-pass metabolism. This resulted in a larger percentage of unmetabolized drug reaching the target site of action. Deuterated compounds with improved bioavailability may be active at lower doses. For example, CTP-354 achieved substantially higher blood levels in *in vivo* preclinical tests than did the corresponding non-deuterated compound at an equivalent dose.
- *Increased half-life.* We have selectively deuterated compounds to prolong their pharmacokinetic profile, which is an increase in the half-life of the compound in the body. This 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. For example, in preclinical *in vivo* testing, JZP-386 demonstrated a prolonged pharmacokinetic profile and reduced variability relative to sodium oxybate.

### Potential for expedited discovery and development of deuterated product candidates

We believe our approach of applying selective deuteration using our DCE Platform has the potential to provide a more efficient and less expensive approach to developing new chemical entity drugs as compared to conventional small molecule drug research and development. Key reasons include:

- By building on the known activity, safety or efficacy of approved drugs, advanced clinical candidates or previously studied compounds, we believe we can progress our product candidates through discovery and into clinical development more quickly than in conventional small molecule drug research and development. In a number of cases, including CTP-499, we have advanced compounds from initial synthesis to clinical evaluation in less than two years.
- We believe the FDA and comparable foreign regulatory authorities may allow some of our compounds that are deuterated analogs of approved products, or of compounds for which approval is pending, to follow an expedited development pathway by relying on previous clinical data regarding the corresponding non-deuterated compound. For example, in several instances, we have received permission to initiate early-stage clinical trials with less extensive preclinical evaluation than is typically required for a new chemical entity.

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Also our collaborator Avanir reported agreeing with the FDA to an expedited development pathway for AVP-786 that would permit Avanir to reference data from its development of dextromethorphan and quinidine in its IND, and any future NDA, for AVP-786.

## OUR PRODUCT CANDIDATES

The following table summarizes key information about our priority programs. All of these product candidates are small molecules designed for oral administration.

Product Candidate	Lead Indication(s)	Preclinical	Phase 1	Phase 2	Phase 3	Worldwide Rights
AVP-786	Alzheimer's Agitation					Avanir
	Major Depressive Disorder					
CTP-699	Diabetic Nephropathy					Concert
CTP-354	Spasticity associated with SCI and MS					Concert
CTP-730	Inflammatory Diseases					Celgene
EZP-386	Narcolepsy					Jazz Pharmaceuticals
Deuterated incubator	Cystic Fibrosis					Concert

### AVP-786

In February 2012, we granted Avanir an exclusive worldwide license to develop and commercialize deuterated dextromethorphan analogs. 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 a deuterated dextromethorphan analog and an ultra-low dose of quinidine, for the treatment of neurologic and psychiatric disorders, including pain, behavioral disorders, mood disorders and movement disorders. In February 2013, Avanir reported positive results from a Phase 1 clinical trial of AVP-786. In June 2013, Avanir reported that the FDA had agreed to an expedited development pathway for AVP-786. In August 2014, Avanir advanced AVP-786 into a Phase 2 clinical trial for adjunctive treatment of major depressive disorder.

Avanir currently markets a combination of dextromethorphan and quinidine, Nuedexta<sup>®</sup>, for pseudobulbar affect, which is a neurological condition characterized by involuntary, sudden and sometimes frequent episodes of laughing or crying. The quinidine in Nuedexta inhibits the metabolism of dextromethorphan. Without a metabolic inhibitor such as quinidine, dextromethorphan is rapidly metabolized by most humans, limiting its effectiveness and resulting in the production of metabolites that are harmful in large amounts. However, quinidine can cause heart rhythm changes. As a result, it is preferable to minimize dosing of quinidine.

Avanir has also reported that it plans to integrate its development of AVP-786 into its ongoing clinical development program for AVP-923, a dextromethorphan and quinidine combination product candidate. Avanir

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reported that AVP-786, which includes a lower dose of quinidine than AVP-923, provided approximately the same pharmacokinetic exposure of the active species as AVP-923 in a Phase 1 clinical trial. In October 2014, Avanir announced positive results in its Phase 2 trial of AVP-923 for Alzheimer's agitation. Avanir announced that, as a result of the successful trial, it has requested a meeting with the FDA to discuss the possibility of continuing development in this indication with AVP-786 in place of AVP-923 by relying on the Phase 2 trial results for AVP-923.

In February 2013, Avanir reported the results of a randomized, double-blind, two-way crossover Phase 1 clinical trial of AVP-786 at a single center in Australia to assess the pharmacokinetic profile, safety and tolerability of single and multiple doses of AVP-786 both with and without quinidine. In this Phase 1 clinical trial, Avanir used AVP-923 as a control. The first stage of this study included 36 healthy subjects. Twelve additional subjects were enrolled in the second stage of the study. Avanir reported results indicating that AVP-786 with a reduced dose of quinidine relative to AVP-923 demonstrated a pharmacokinetic profile comparable to AVP-923 with comparable safety and tolerability.

In August 2014, Avanir initiated a Phase 2 randomized, placebo-controlled clinical trial to evaluate the safety and efficacy of AVP-786 as an adjunctive treatment in patients with major depressive disorder.

Avanir has reported plans to expedite the completion of one of its ongoing AVP-923 clinical trials to guide development of AVP-786. Avanir has stated that it intends to replace AVP-923 with AVP-786 in future clinical evaluation. In addition, Avanir has stated that the FDA has agreed to an expedited development pathway for AVP-786 that would permit Avanir to reference data generated during its clinical testing of AVP-923 in its IND, and any future NDA, for AVP-786.

## CTP-499

### *Overview*

CTP-499 is a novel oral multi-subtype selective inhibitor of phosphodiesterases, which are enzymes that we believe play an important role in chronic kidney disease in patients with type 2 diabetes, a condition referred to as diabetic nephropathy. We are developing CTP-499 to slow the progression of diabetic nephropathy in patients with macroalbuminuria, which is a high level of the blood protein albumin in the urine and an indicator of kidney damage. We are developing CTP-499 as an additive treatment to the current standard of care for diabetic nephropathy, angiotensin modulation, which is treatment with an angiotensin converting enzyme inhibitor or an angiotensin receptor blocker. We have completed a three-part Phase 2 clinical trial of CTP-499 in which we enrolled patients with diabetic nephropathy and macroalbuminuria who were receiving standard-of-care treatment. We believe that CTP-499, if approved in this indication, has the potential to address a substantial commercial market opportunity. Despite the protective effect of angiotensin modulators kidney disease still progresses in many diabetic patients, and we estimate that each year over 40,000 patients with type 2 diabetes progress to end-stage kidney failure in the United States. We expect that we would conduct any large Phase 3 clinical trial of CTP-499 in diabetic nephropathy in collaboration with one or more partners.

CTP-499 is a deuterated analog of 1-(S)-5-hydroxyhexyl-3,7-dimethylxanthine, or HDX, an active metabolite of pentoxifylline. Pentoxifylline was approved over three decades ago for the treatment of intermittent claudication, or lower limb pain resulting from obstructed arteries, and has a well-established safety profile. Investigator-sponsored, single site clinical studies have evaluated pentoxifylline in chronic kidney disease patients, including in patients with diabetes, who were also simultaneously treated with an angiotensin modulator. In most of these studies, the investigator reported that patients experienced a reduction in albuminuria. In some of these studies, which were conducted for at least 12 months, the investigator also reported a slowing in decline of kidney function in patients receiving pentoxifylline compared to the decline in patients receiving placebo. We chose to develop CTP-499 because our preclinical research, combined with literature data, indicated that HDX, rather than pentoxifylline, may be responsible for the majority of these observed beneficial effects of pentoxifylline in humans.

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### *CTP-499 Phase 2 Clinical Trial*

We have completed dosing in a Phase 2 placebo-controlled clinical trial of CTP-499 in patients with diabetic nephropathy. In December 2014, we completed dosing in an open-label extension study that was the last part of the Phase 2 trial. All patients enrolled in the clinical trial were concurrently treated with angiotensin modulators. The primary objective of the trial was to evaluate the safety and efficacy of CTP-499 administered in twice daily oral doses of 600 mg in a controlled release formulation for a minimum of 24 weeks. The primary endpoint was measurement of changes in the urinary albumin to creatinine ratio, or UACR, at 24 weeks. Albumin is a common protein in the blood, and appears in the urine when there is kidney damage. Urine creatinine levels are used to normalize measurements of albumin excretion. Key secondary endpoints were changes in serum creatinine and estimated glomerular filtration rate, each of which is a measure of renal function, and UACR, as well as safety, including incidence of adverse events, over 48 weeks.

We observed a favorable trend in the levels of serum creatinine, a key secondary endpoint, after 48 weeks of treatment with CTP-499 compared to placebo:

- The mean serum creatinine level in the 65 patients receiving CTP-499 increased by 0.13 mg/dL compared to an increase of 0.21 mg/dL in the 58 patients receiving placebo through the 48 weeks of treatment ( $p = 0.057$ ).
- Six out of the 58 patients receiving placebo, or 10.3%, experienced a 50% or greater increase in serum creatinine levels after 48 weeks compared with one out of the 65 patients receiving CTP-499, or 1.5% ( $p = 0.026$ ).

These data may indicate a trend toward a slower decline of kidney function in patients treated with CTP-499 compared to those who received placebo.

The primary endpoint of the trial was the change after 24 weeks in UACR. While the trial did not meet this endpoint, the data at 48 weeks suggested a favorable trend in UACR for patients receiving CTP-499 as compared to placebo. At 48 weeks, UACR in patients receiving CTP-499 increased 24 mg/g from baseline compared to a 223 mg/g increase in patients receiving placebo ( $p = 0.097$ ). These data may indicate a stabilization of UACR in patients treated with CTP-499 compared to those who received placebo.

The treatment effects observed at 48 weeks were accompanied by statistically significant improvements in the levels of certain key biomarkers that are associated with the progression of diabetic nephropathy, such as urinary fibronectin plasma collagen IV, kidney injury molecule-1, or KIM-1, and or tumor necrosis, or TNFR2, as well as biomarkers associated with tubule cell damage and inflammation. Treatment with CTP-499 resulted in 52% less urinary fibronectin ( $p = 0.0081$ ), 18% less plasma collagen IV ( $p = 0.022$ ), 46% less plasma KIM-1, ( $p = 0.002$ ) and 11% less plasma TNFR2 ( $p = 0.0067$ ) after 48 weeks compared to placebo. Importantly, KIM-1 and TNFR2 biomarkers have been shown in independent, multi-year follow-up clinical trials to be highly predictive of functional decline and risk of end-stage renal disease in patients with kidney disease. The positive effects of CTP-499 on these biomarkers were more pronounced in patients who began the Phase 2 trial with UACR levels that were above the median. This finding was consistent with an earlier post-hoc analysis showing that the lower increase in serum creatinine as a result of CTP-499 treatment was more evident in patients with higher baseline levels of UACR. We may take these results into consideration in designing a potential Phase 3 trial for CTP-499 in diabetic nephropathy.

Treatment with CTP-499 was generally well tolerated. Gastrointestinal events were reported more frequently in the CTP-499 arm, with mild to moderate nausea being the most commonly reported event. There were a total of 33 patients with at least one serious adverse event reported in the trial; none of these serious adverse events were judged by the investigators to be possibly related to study drug. These events occurred in 20% of patients receiving CTP-499 and 17% of patients receiving placebo. Fewer patients dropped out of the CTP-499 arm than the placebo arm throughout the blinded parts of the study.

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In July 2014, we conducted an end of Phase 2 meeting with the FDA for CTP-499. During the meeting, the FDA indicated general agreement with our proposed Phase 3 development plan providing flexibility to conduct either two clinical trials with CTP-499 or a single trial evaluating two doses of CTP-499 compared to placebo. A reduction in the rate of progression of renal disease measured by a time-to-event analysis of the composite confirmed increases in serum creatinine (greater than or equal to 50%) or incidence of end stage renal disease, versus placebo-treated patients, was agreed to be an acceptable Phase 3 endpoint to support filing a potential NDA. We expect to negotiate a Special Protocol Assessment with the FDA in 2015. We intend to seek a partner to advance the development of CTP-499 in diabetic nephropathy.

### CTP-354

CTP-354 is a novel, potentially first-in-class, non-sedating treatment for spasticity that we are initially developing for use in patients with spinal cord injury and patients with multiple sclerosis. CTP-354 is a subtype selective GABA<sub>A</sub> receptor modulator. GABA<sub>A</sub> receptors are found in the nervous system and, when activated, reduce the transmission of certain nerve signals. GABA<sub>A</sub> receptors can possess one of a number of  $\alpha$  subunits, including  $\alpha$  1,  $\alpha$  2,  $\alpha$  3 and  $\alpha$  5. The pharmacological effects of activating a GABA<sub>A</sub> receptor in the nervous system are believed to depend mainly on which type of  $\alpha$  subunit the receptor contains.

Several classes of widely used drugs target GABA<sub>A</sub> receptors, including benzodiazepines such as diazepam (Valium). Benzodiazepines are used for the treatment of anxiety, spasticity, muscle tension, insomnia, acute alcohol withdrawal and seizures. Activation of  $\alpha$  1 GABA<sub>A</sub> receptors is believed to be mainly responsible for sedation and ataxia, which is a lack of muscle control during voluntary movements, associated with benzodiazepine use, and may also contribute to their amnesiac and habituating effects. Activation of  $\alpha$  2,  $\alpha$  3 and  $\alpha$  5 GABA<sub>A</sub> receptors is believed to cause other therapeutic effects of benzodiazepines, including anti-spasticity, muscle relaxation, anti-anxiety, anti-seizure and potentially anti-pain activities. Some sleep agents, such as zolpidem (Ambien<sup>®</sup>) and zaleplon (Sonata<sup>®</sup>), also target GABA<sub>A</sub> receptors, but activate  $\alpha$  1 GABA<sub>A</sub> receptors significantly more potently than the other  $\alpha$  subtypes, which is believed to cause their pronounced sedative properties. Based on this clinical precedent as well as a variety of preclinical models, we believe that a compound that activates  $\alpha$  2,  $\alpha$  3 and  $\alpha$  5 GABA<sub>A</sub> receptors but does not significantly activate  $\alpha$  1 GABA<sub>A</sub> receptors will have clinical effects similar in a number of important respects to benzodiazepines, including anti-spasticity, muscle relaxant, anti-seizure and potentially anti-pain effects, but without the strong sedative effects of benzodiazepines.

CTP-354 is a deuterated analog of a compound discovered by Merck & Co. referred to as L-838417. L-838417 was found in preclinical animal studies to possess certain therapeutic benefits of the benzodiazepine class of drugs, but without their predominantly sedative effect. Merck reported that, in *in vitro* testing, L-838417 activated the  $\alpha$  2,  $\alpha$  3 and  $\alpha$  5 GABA<sub>A</sub> receptors, which are associated with anti-spasticity, muscle relaxation, anti-anxiety, anti-seizure and, potentially, anti-pain activities, with approximately 40% of the *in vitro* activity of a benzodiazepine, with no significant activity at the  $\alpha$  1 GABA<sub>A</sub> receptors. Moreover, in a number of *in vivo* animal studies, L-838417 provided potent muscle relaxant, anti-anxiety, anti-convulsant and anti-pain activity, without causing apparent sedation or ataxia. In preclinical animal testing, Merck identified pharmacokinetic limitations of L-838417 relating to bioavailability and variability and did not progress the compound into clinical development. We designed CTP-354 to overcome the pharmacokinetic limitations of L-838417 while retaining its attractive pharmacological profile.

We believe that CTP-354 has the potential to provide therapeutic benefits without the limitations of existing spasticity therapies, which can include severe sedative effects, toxicity, frequent dosing or invasiveness. Spasticity is a chronic condition characterized by involuntary tightness, stiffness or contraction of muscles that occurs in patients who have damage to the brain or spinal cord. Spasticity can result from a wide range of disorders, including multiple sclerosis, spinal cord injury, cerebral palsy, amyotrophic lateral sclerosis, stroke and hereditary spastic paraplegia. Symptoms can range from mild muscle tightness to more severe symptoms, including crippling and painful inability to move limbs that can result in disability and diminished quality of life.

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We have completed single and multiple ascending dose Phase 1 clinical trials to evaluate the safety, tolerability and pharmacokinetics of CTP-354 in healthy volunteers. We have also conducted a Phase 1 positron emission tomography, or PET, imaging trial to assess the brain GABA<sub>A</sub> receptor occupancy of CTP-354 following a single dose or multiple dose of the compound in healthy volunteers. CTP-354 demonstrated highly favorable pharmacokinetics with low variability, dose-proportional exposure and a long half-life in the body. We believe these results support once-daily dosing, which would provide a substantial improvement on the three-times-daily dosing required by current standard-of-care oral spasticity medicines. In our Phase 1 clinical trials, CTP-354 provided much higher levels of GABA<sub>A</sub> receptor occupancy without causing sedation than benzodiazepines at doses that are typically prescribed, which we believe supports the potential of CTP-354 to be a non-sedating treatment for spasticity. CTP-354 has been clinically assessed in more than 100 healthy volunteers and treatment was generally well tolerated with no serious adverse events.

In November 2014, we received preliminary three-month toxicology data from a non-clinical *in vivo* study of CTP-354 showing adverse effects. In January 2015, we received study reports confirming that significant adverse effects were limited to one of the two species studied. We intend to conduct additional non-clinical studies to further evaluate CTP-354 and assess CTP-354's development profile before advancing the compound into Phase 2 clinical testing.

### CTP-730

In April 2013, we entered into a strategic worldwide collaboration with Celgene related to deuterium-substituted compounds for the treatment of inflammation or cancer. We are initially focusing on one program; however, the collaboration has the potential to encompass multiple programs. In the initial program, we have selected CTP-730, a product candidate for the treatment of inflammatory diseases. In September 2014, we announced the initiation of a single ascending dose Phase 1 clinical trial designed to assess the safety, tolerability and pharmacokinetics of CTP-730. The Phase 1 clinical program is designed to also evaluate multiple ascending doses of CTP-730 and is expected to be completed in 2015. We are responsible for development, at our expense, through the completion of single and multiple ascending dose Phase 1 clinical trials.

### JZP-386

In February 2013, we licensed to Jazz Pharmaceuticals the commercial rights to deuterated analogs of sodium oxybate, including JZP-386, under an exclusive worldwide license agreement. Sodium oxybate is the active ingredient in Xyrem, a prescription medicine marketed in the United States by Jazz Pharmaceuticals to treat two of the key symptoms of narcolepsy, excessive daytime sleepiness and cataplexy. For the year ended December 31, 2014, Jazz Pharmaceuticals reported Xyrem annual net sales of \$778.6 million as compared to net Xyrem sales of \$569.1 million for year ended December 31, 2013.

In preclinical *in vivo* testing, JZP-386 demonstrated a prolonged pharmacokinetic profile and reduced variability relative to sodium oxybate. We are responsible for conducting specified preclinical and clinical activities for JZP-386 through and including Phase 1 clinical trials. Jazz Pharmaceuticals is responsible for manufacturing clinical material and reimbursing us for certain costs associated with our program-related activities, subject to limitations specified in the agreement, including adherence within a particular percentage to a development budget. Following Phase 1 clinical trials, Jazz Pharmaceuticals is also responsible for conducting and funding all further development and commercialization of JZP-386.

In July 2014, we and Jazz Pharmaceuticals announced the initiation of the first-in-human Phase 1 clinical trial of JZP-386. The Phase 1 program is comparing JZP-386 to sodium oxybate versus placebo in healthy volunteers. In December 2014, we and Jazz Pharmaceuticals announced that Phase 1 clinical data generated to date supports completing the Phase 1 evaluation of JZP-386 at the originally planned highest dose, which was not administered in the first Phase 1 clinical trial due to a technical dosing issue. A second Phase 1 trial evaluating JZP-386 at the originally planned highest dose was initiated in the first quarter of 2015 with data expected in the second quarter

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of 2015 which will inform the next steps in the development of the program. JZP-386 is being treated as a Schedule I Controlled Substance by the U.S. Drug Enforcement Agency, or DEA, and being regulated accordingly. See “—Government Regulations—Regulation of Controlled Substances” for additional information.

### Deuterated Ivacaftor

We have selected deuterated ivacaftor for the potential treatment of cystic fibrosis as our next clinical development candidate. Our preclinical data indicates that several of our deuterium-enhanced ivacaftor analogs possess improved pharmacokinetic parameters relative to ivacaftor. Cystic fibrosis is a life-threatening, hereditary genetic disease that primarily affects the lungs and digestive system. The cause is a defect in the gene that encodes for cystic fibrosis transmembrane conductance regulator, a protein which regulates components of sweat, mucus and digestion. According to the Cystic Fibrosis Foundation, an estimated 70,000 people worldwide have cystic fibrosis. Many people with the disease can now live into their 30s and beyond. We intend to advance our deuterated ivacaftor program into clinical evaluation in the first half of 2015.

### OTHER PIPELINE OPPORTUNITIES

We have discovered a significant number of additional compounds utilizing our DCE Platform that have potential application in many different therapeutic areas, including central nervous system disorders, genetic diseases, renal disease, inflammatory disease and cancer. We are evaluating these programs for possible further development, either by us alone or in collaboration with another party.

### COLLABORATIONS

We are party to a number of collaborations for the research, development and commercialization of deuterated compounds. Through December 31, 2014, we had received an aggregate of \$109.9 million in upfront and milestone payments, equity investments and research and development funding from current and former collaborations. Under our current collaborations, which are described below, we have the potential to receive up to \$1.6 billion in future milestone payments, including over \$1.2 billion in research, development and regulatory milestones, as well as royalties on any future net product sales.

#### Celgene

*Overview.* 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. The collaboration is initially focused on one program, but has the potential to encompass up to four programs. For the initial program, we granted Celgene an exclusive worldwide license to develop, manufacture and commercialize deuterated analogs of a selected non-deuterated compound and certain close chemical derivatives thereof. We further granted Celgene licenses with respect to two additional programs and an option with respect to a third additional program. We and Celgene have agreed on the non-deuterated compounds for each of the two additional license programs. For the option program, Celgene may select the non-deuterated compound at a later time, which, unless otherwise agreed by us, will be limited to a compound for which Celgene possesses exclusive rights. With respect to the two additional license programs, we granted Celgene an upfront exclusive worldwide license to develop, manufacture and commercialize deuterated products that contain deuterated analogs of the agreed non-deuterated compounds. Celgene is restricted from utilizing their research, development and commercialization rights under each of these upfront licenses, unless, within seven years after the effective date of the agreement, Celgene pays us a license exercise fee. If Celgene does not elect to pay the license exercise fee during the seven year period, the license will expire. With respect to the option program, once a compound is selected, Celgene may exercise its option by paying us an option exercise fee within seven years of the effective date of the agreement, and upon Celgene’s exercise of the option we will grant to Celgene an exclusive worldwide license to develop, manufacture and commercialize deuterated products that contain deuterated analogs of the selected non-deuterated compound.

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*Research Obligations.* We are responsible for conducting and funding research and early development activities for the initial program at our own expense pursuant to mutually agreed upon development plans. This includes the completion of single and multiple ascending dose Phase 1 clinical trials and any mutually agreed upon additional Phase 1 clinical trials, as set forth in the development plan and approved by the joint steering committee for the collaboration.

We do not have any obligation to conduct any research or development activities for any of the additional programs unless and until Celgene exercises its rights with respect to such program and pays us the applicable exercise fee. 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. 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.

Celgene is responsible for all development costs with respect to the initial program beyond the Phase 1 clinical trials that we conduct. If Celgene exercises its rights with respect to any additional program, Celgene will be solely responsible for all research, development and commercialization costs for such program following the completion of the first Phase 1 clinical trial for such program.

Following its assumption of responsibility for development costs of a product candidate, Celgene is required to use commercially reasonable efforts to develop, obtain regulatory approval for and commercialize the product candidate until such time, if any, as Celgene determines in its reasonable discretion based on comparative metrics that that product candidate does not represent a substantial improvement over the corresponding non-deuterated compound.

*Governance.* Oversight of the development program for each category of licensed products under the agreement is guided by separate joint steering committees. There is likewise a joint patent committee to discuss and guide all matters for any patents owned by or licensed to us relating to the licensed products.

*Payments.* Under the terms of the agreement, we received a non-refundable upfront payment of \$35.0 million. In addition, we are eligible to earn up to \$23.0 million in development milestone payments, including \$8.0 million related to the completion of a Phase 1 clinical trial, 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 initial program. If Celgene exercises its rights with respect to either of the two additional license programs, we 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 we are eligible to receive up to \$100.0 million in sales-based milestone payments based on net sales of products, and with respect to the other additional license program we are eligible to receive up to \$50.0 million in sales-based 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, we 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 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%. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the latest of expiration of specified patent coverage, expiration of regulatory exclusivity or 10 years following commercial launch. 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.



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*Exclusivity Restrictions.* During the term of the agreement, we may not research, develop or commercialize, or grant or offer to grant a third party a license to research, develop or commercialize, any licensed product, and with respect to the option program, certain products that Celgene has the right to select as an option product, other than pursuant to the agreement.

*Term and Termination.* The agreement will expire upon the later of the seventh anniversary of the effective date of the agreement and the expiration of all royalty terms with respect to each licensed product in each country. Celgene has the right to terminate the agreement, in whole or only with respect to a particular licensed product, upon 60 days prior written notice to us. The agreement may also be terminated by us in the event of an uncured material breach by Celgene. If the agreement is terminated for any reason, the licenses granted by us to Celgene will terminate and specified rights to licensed products will revert to us.

### Avanir

*Overview.* 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 containing products. Subsequent to our agreement, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. and it is now a wholly owned subsidiary of Otsuka America, Inc. Avanir is initially focused on developing AVP-786, which is a combination of a deuterated dextromethorphan analog and an ultra-low dose of quinidine, for the treatment of neurologic and psychiatric disorders.

*Research Obligations.* Under the agreement, upon Avanir's request, we were obligated to provide research and development services with respect to licensed products pursuant to an agreed upon research and development plan until the first acceptance of an IND for any licensed product filed by Avanir, which occurred in July 2014. We are obligated to use commercially reasonable efforts to conduct and complete the activities assigned to us under the agreement. Avanir is required to use commercially reasonable efforts to develop and commercialize licensed product candidates for specified numbers of indications in the United States, European Union and Japan. Avanir is responsible for funding 100% of our research and development costs incurred under the development plan or for activities conducted at Avanir's request, including pass-through costs and a rate per full-time equivalent, or FTE, year of our employees' time, which we mutually agreed to, subject to limitations specified in the agreement. However, Avanir is currently conducting all research and development activities without our services.

*Governance.* Our collaboration with Avanir is guided by a joint steering committee. There is likewise a joint patent committee to discuss and guide all matters for any patents owned by or licensed to us relating to the licensed products or otherwise filed with respect to certain inventions within the scope of the collaboration.

*Payments.* Under the agreement, we received a non-refundable upfront payment of \$2.0 million, a milestone payment of \$2.0 million in 2013, and a milestone payment of \$2.0 million in 2014. We are also eligible to earn, with respect to licensed products comprising a combination of deuterated dextromethorphan and quinidine, up to \$2.0 million in development milestone payments related to initiation of dosing in a Phase 3 clinical trial for AVP-786, up to \$37.0 million in regulatory and commercial launch milestone payments and up to \$125.0 million in sales-based milestone payments. In addition, we are eligible for higher development milestones, up to an additional \$43.0 million, for licensed products that do not require quinidine. Avanir is currently developing deuterated dextromethorphan only in combination with quinidine. Avanir also 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. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the later of expiration of specified patent coverage or 10 years following commercial launch. 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.

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*Exclusivity Restrictions.* During the term of the agreement, neither we nor Avanir may research, develop or commercialize any product that contains deuterated dextromethorphan or grant or offer a license under any deuterated dextromethorphan specific intellectual property, other than pursuant to the agreement. We are also subject to certain additional exclusivity restrictions as set forth in the agreement, including certain restrictions on the development, commercialization and licensing of deuterated dextromethorphan analogs, such as C-10068, for the treatment of pseudobulbar affect or behavioral symptoms in dementia patients.

*Term and Termination.* The agreement will expire on a licensed product-by-licensed product and country-by-country basis on the date of the expiration of the applicable royalty term with respect to each licensed product in each country. Following the earlier of the completion of a specified Phase 2 clinical trial milestone or the second anniversary of the effective date of the agreement, Avanir has the right to terminate the agreement upon 90 days prior written notice to us. We may terminate the agreement if Avanir ceases to develop or commercialize licensed products and does not recommence development or commercialization efforts following our notice to Avanir. The agreement may also be terminated by either Avanir or us in the event of an uncured material breach by the other party.

If the agreement is terminated for any reason, the licenses granted by us to Avanir will terminate. Further, if the agreement is terminated, other than by Avanir as a result of our material breach of the agreement, specified rights to licensed products will revert to us and Avanir will be required, following our request, to grant us a license under specified intellectual property controlled by Avanir and related to licensed products. If the termination takes place after the completion of a Phase 2 clinical trial for a licensed product, we are required to pay a royalty on our net product sales of licensed products until such time as Avanir has recovered a multiple of the out-of-pocket expenses paid by Avanir to develop the licensed product prior to termination of the agreement. If the termination takes place after Avanir has generated Phase 3 clinical data, we are generally restricted for a specified period of time following termination from marketing any licensed product that is approved by the applicable regulatory authority based on the Phase 3 clinical data generated by Avanir.

### **Jazz Pharmaceuticals**

*Overview.* In February 2013, we entered into a development and license agreement with Jazz Pharmaceuticals to research, develop and commercialize products containing deuterated sodium oxybate, or D-SXB. We are initially focusing on one analog, designated as JZP-386. 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.

*Research Obligations.* We, together with Jazz Pharmaceuticals, are conducting certain development activities for a Phase 1 clinical trial with respect to JZP-386 pursuant to an agreed upon development plan. We are responsible under the development plan for conducting a Phase 1 clinical trial with respect to JZP-386. Thereafter, our obligations to conduct further development activities are subject to mutual agreement. Jazz Pharmaceuticals has assumed all manufacturing responsibilities. Pursuant to the agreement, our costs for activities under the development plan, including pass-through costs and the costs of our employees' time at a rate per full-time equivalent year of our employees' time, which we mutually agreed to, are reimbursed by Jazz Pharmaceuticals, except for the costs of an additional Phase 1 clinical trial that was initiated in the first quarter of 2015, which will be shared between Jazz Pharmaceuticals and us. This reimbursement is subject to limitations specified in the agreement, including adherence within a particular percentage to the development budget. Under the agreement, Jazz Pharmaceuticals is subject to specified diligence obligations regarding the development and commercialization of licensed products.

*Governance.* Our collaboration with Jazz Pharmaceuticals is guided by a joint steering committee and a joint patent committee.

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*Payments.* Under the agreement, we received a non-refundable upfront payment of \$4.0 million and we are 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. 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 a country-by-country and licensed product-by-licensed product basis, on worldwide net product sales of licensed products. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the later of the expiration of specified patent coverage or 10 years following commercial launch. The royalty rate is lowered, on a country by country basis, under certain circumstances as specified in the agreement.

*Exclusivity Restrictions.* During the term of the agreement, subject to exceptions specified in the agreement, we may not grant or offer a license or other rights to a third party with respect to, or research, develop, manufacture or commercialize, D-SXB compounds, licensed products, sodium oxybate or any compounds that are structurally similar to and have substantially similar biological activity to D-SXB.

*Term and Termination.* The agreement will expire on a licensed product-by-licensed product and country-by-country basis on the date of the expiration of the applicable royalty term with respect to each licensed product in each country. Jazz Pharmaceuticals may terminate the agreement, on a country-by-country basis or in its entirety, upon 90 days prior written notice to us. We may terminate the agreement upon written notice to Jazz Pharmaceuticals if Jazz Pharmaceuticals decides to permanently cease development and commercialization of all licensed products. We may also terminate the agreement if Jazz Pharmaceuticals has abandoned development or commercialization activities for licensed products and following notice from us does not resume development or commercialization activities. The agreement may also be terminated by either party in the event of an uncured material breach by the other party.

If the agreement is terminated for any reason, the licenses granted by us to Jazz Pharmaceuticals with respect to D-SXB products will terminate and specified rights to licensed products will revert to us. In addition, at our request, both parties will enter into good faith negotiations to agree upon commercially reasonable royalties payable by us for a non-exclusive license under intellectual property controlled by Jazz Pharmaceuticals, and made in the course of developing licensed products, to develop, manufacture and commercialize licensed products.

Following termination of the agreement with respect to a country or countries, but not in its entirety, by Jazz Pharmaceuticals for Jazz Pharmaceuticals' convenience, Jazz Pharmaceuticals may provide us written notice that it desires to continue or recommence development and commercialization of licensed products in such country or countries, in which event Jazz Pharmaceuticals' license with respect to D-SXB products in such country or countries and corresponding payment obligations under the agreement will be reinstated except in specified circumstances in which we have previously notified Jazz Pharmaceuticals of our intent to develop or commercialize licensed products in such country or countries either directly or through a third party licensee.

## 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.

### AVP-786

We hold U.S. patents covering the composition of matter and methods of use of the deuterated dextromethorphan analog that comprises AVP-786. These patents have expirations from 2028 to 2030. We also have a pending U.S. patent application covering methods of use of certain other dextromethorphan compounds. We have corresponding issued patents in Europe and Japan that expire in 2028. We have granted exclusive licenses under these patent rights to Avanir.

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### CTP-499

We hold a U.S. patent that covers the composition of matter of CTP-499 and related compounds. This patent expires in 2029. We also have pending U.S. patent applications that cover CTP-499 and related compounds. We have two patent applications for CTP-499 in Europe and two issued patents in Japan that cover the composition of matter of CTP-499. Patents that issue from the European patent applications would expire in 2029 and 2030. The issued Japanese patents expire in 2029 and 2030. We have retained all of the CTP-499 patent rights.

### CTP-354

We hold U.S. patents covering the composition of matter of CTP-354 and related compounds as well as pharmaceutical compositions and methods covering CTP-354 and related compounds. These patents expire in 2029. We also have a pending U.S. patent application. We have corresponding issued patents in Europe and Japan that expire in 2029. We have retained all of the CTP-354 patent rights.

### JZP-386

We hold a U.S. patent covering the composition of matter of deuterated analogs of sodium oxybate, including JZP-386, and their methods of use for treating certain diseases and disorders, including narcolepsy, as well as a corresponding U.S. continuing application. The expiration of this patent and this application occur in 2030. We hold a corresponding European patent that expires in 2030. We also have patent applications in the United States, Europe and Japan that cover JZP-386 and related compounds and their methods of use for treating certain diseases and disorders, including narcolepsy that, if issued, would expire in 2032. We have granted exclusive licenses under these patent rights to Jazz Pharmaceuticals.

### Celgene Collaboration

We hold U.S. patents and a U.S. patent application covering the composition of matter of deuterated analogs of one of the compounds that we have exclusively licensed to Celgene and U.S. patent applications covering other compounds that we have exclusively licensed to Celgene. The patents expire in 2030 and the patent applications, if issued as patents, would expire between 2029 and 2034. We also have provisional U.S. patent applications for compounds that we have exclusively licensed to Celgene. We have issued patents in Europe and Japan for compounds that we have exclusively licensed to Celgene that expire between 2029 and 2034.

### D-Ivacaftor

We hold a U.S. patent covering the composition of matter of deuterated analogs of ivacaftor and a corresponding U.S. continuing application. The expiration of this patent and this application occur in 2032. We have corresponding patent applications in Europe and Japan that, if issued, would expire in 2032. We have retained all of the deuterated ivacaftor patent rights.

### 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

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compensation for the patent term lost during the FDA regulatory review process. The Hatch-Waxman Act permits 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 *in vitro* and *in vivo* systems; and
- our methods to determine the degree of deuterium substitution in compounds we manufacture.

## MANUFACTURING AND SUPPLY

We have developed the internal capability to manufacture up to low kilogram quantities of deuterated active pharmaceutical ingredients for use in Phase 1 clinical trials. Our manufacturing facility occupies approximately 700 square feet at our facility in Lexington, Massachusetts.

While our manufacturing capabilities can support Phase 1 clinical trials, 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 efficiency as we manufacture compounds 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

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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 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 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 biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. 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, diabetic nephropathy, spasticity, inflammation and cancer, and cystic fibrosis, the key indications for our priority programs. Several large pharmaceutical and biotechnology companies have also begun to cover deuterated analogs of their product candidates in patent applications and may choose to develop these deuterated compounds. In addition, we know of one biotechnology company, Auspex Pharmaceuticals, Inc., and possibly two others, DeuteRx LLC and Berolina innovative Research and Development Services Pharma GmbH, that are developing product candidates based on deuterium substitution. Potential competitors also include academic institutions, government agencies and other public and private research organizations.

Many of our existing and potential future competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and

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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.

The key competitive factors affecting the success of all of our product candidates, if approved, are likely to be their efficacy, product labeling, side effect profiles, safety, convenience, price, particularly if there is generic competition, differentiation from their corresponding non-deuterated compounds when applicable, and the availability of reimbursement from government and other third party payors.

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 regulatory approval for their products sooner than we or our collaborators may 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.

In addition, we anticipate that some of the product candidates that we or our collaborators may develop will be deuterated analogs of approved drugs, some of which are or will then be available on a generic basis. If such deuterated analogs are approved, we expect that they will compete against branded and generic non-deuterated compounds in the same indications based on enhanced efficacy, safety or convenience of dosing. If physicians do not believe that a product that we or our collaborators develop offers substantial advantages over the corresponding non-deuterated compound, or that the advantages offered by our product as compared to the corresponding non-deuterated compound are not sufficient to merit the increased price over the corresponding non-deuterated compound that we or our collaborators would seek, physicians might not prescribe our product.

If the product candidates for our priority programs are approved for the indications for which we or our collaborators are currently undertaking clinical trials, they will compete with the therapies discussed below and will likely compete with other therapies that are currently in development.

### *AVP-786*

Avanir is developing AVP-786 for the treatment of neurologic and psychiatric disorders. There are a number of marketed drugs and product candidates in clinical development for these indications.

### *CTP-499*

The current standard of care for diabetic nephropathy in patients with macroalbuminuria is treatment with angiotensin modulators. Angiotensin modulators are available on a generic basis. We are developing CTP-499 as an additive treatment to this current standard of care. If CTP-499 receives marketing approval, it may face competition from a number of product candidates that are currently in clinical development, including potentially competitive product candidates in Phase 3 clinical development being pursued by AbbVie Inc., Janssen Research & Development LLC and NephroGenex, Inc.

### *CTP-354*

We are initially developing CTP-354 for the treatment of spasticity associated with spinal cord injury and multiple sclerosis. Current first-line treatment for spasticity includes oral and local agents and physical and occupational therapy. Four oral drugs have been approved in the United States for the treatment of spasticity: baclofen (Lioresal), tizanidine (Zanaflex), diazepam (Valium) and dantrolene (Dantrium), each of which is available on a generic basis. Spasticity is also treated through localized injections of botulinum toxin. In addition,

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there are several potentially competitive product candidates in Phase 3 clinical development being pursued by pharmaceutical and biotechnology companies, including GW Pharmaceuticals plc and Osmotica Pharmaceuticals Corp.

### *JZP-386*

JZP-386 is in a Phase 1 clinical trial for the treatment of cataplexy and excessive daytime sleepiness, with potential advantages over sodium oxybate, the current standard of care. Flamel Technologies is currently developing an extended release formulation of sodium oxybate for the treatment of narcolepsy.

## 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 preclinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice, or GLP, regulations;
- submission to the FDA of an IND, which allows human clinical trials to begin unless the FDA objects within 30 days;
- approval by an independent institutional review board, or IRB, representing each clinical site before each clinical trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with the FDA's current Good Clinical Practices, or cGCPs, to establish the safety and efficacy of the proposed drug product for each indication;
- preparation and submission to the FDA of an NDA;
- satisfactory 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 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;



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- 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.

### *Preclinical Studies and an IND*

Preclinical studies can include *in vitro* and animal studies to assess the potential for adverse events and, in some cases, to establish a rationale for therapeutic use. The conduct of preclinical 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 preclinical tests, 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 preclinical 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. 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 cGCP 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.

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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 optimal dosage.
- 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 typically inspect one or more clinical sites in late-stage clinical trials to assure compliance with cGCP 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 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 type of application allows the applicant to rely, in part, on the FDA's previous findings of safety and efficacy for a similar product, or 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 preclinical 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.

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### *Submission of an NDA to the FDA*

Assuming successful completion of required clinical testing and other requirements, the results of the preclinical 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 an application user fee, currently exceeding \$2.1 million, and the sponsor of an approved NDA is also subject to annual product and establishment user fees, currently exceeding \$104,000 per product and \$554,600 per establishment. These fees are typically increased annually.

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 cGCP.

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

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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;

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- 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 preclinical 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.

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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*

Upon approval of an NDA or a supplement thereto, NDA sponsors are required to list with the FDA each patent with claims that cover the applicant's product or 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

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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 Drug Price Competition and Patent Term Restoration Act of 1984 (commonly referred to as 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.

### **Regulation of Controlled Substances**

We handle a product that is treated as a "controlled substance" under the Controlled Substances Act of 1970, or CSA. The CSA authorizes the DEA to regulate the registration, procurement, manufacturing, production, possession, labeling and distribution of controlled substances. Controlled substances are classified as Schedule I, II, III, IV or V substances, with Schedule I substances considered to present the highest risk of substance abuse and Schedule V substances the lowest risk.

Our product candidate JZP-386, which we have licensed to Jazz Pharmaceuticals, is a deuterium substituted analog of sodium oxybate. Sodium oxybate is regulated as a chemical by the DEA as a Schedule I controlled substance. However, when formulated into Xyrem, the drug product is regulated as a Schedule III substance. Because of the Schedule I classification of sodium oxybate, JZP-386 is regulated by the DEA as a Schedule I controlled substance. If JZP-386 becomes approved as the active pharmaceutical ingredient in a drug product, the DEA may decide to regulate the drug product as a Schedule III controlled substance, similar to Xyrem.

The manufacture, shipment, storage, sale and use of Schedule I substances are subject to a high degree of regulation. Every person who manufactures, distributes, dispenses, imports or exports any controlled substance

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must register with the DEA, unless they are exempt. Moreover, for Schedule I substances, the CSA authorizes the DEA to establish aggregate production quotas for all manufacturers, individual production quotas for specific registered manufactures and individual production quotas for registrants who have not manufactured controlled substances during one or more proceeding years.

We expect our product candidate CTP-354 to be classified as a Schedule IV substance under the CSA. The CSA also places significant restrictions on substances which have been classified in Schedules III and IV. While these restrictions are not as severe as those governing substances in Schedules I and II, they nonetheless establish strict limitations on the manufacture, sale and distribution of Schedule III and IV substances. For example, prescriptions for controlled substances that are prescription drugs in such schedules may only be filled or refilled by pharmacists up to five times within six months after the date on which the prescription was issued, unless the prescribing practitioner renews the prescription.

The failure to maintain compliance with applicable requirements under the CSA can result in enforcement action that could have a material adverse effect on our business, results of operations and financial condition. The DEA may inspect facilities, seek civil penalties, refuse to renew necessary registrations or initiate proceedings to revoke those registrations. In certain circumstances, violations could lead to criminal proceedings. Individual states also regulate controlled substances, and we and our contract manufacturers are subject to state regulation on distribution of these products.

### **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.



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

The decentralized procedure is available to applicants who wish to market a product in various 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, including a draft summary of product characteristics, and draft labeling and package leaflet, to the reference member state and concerned member states. The reference member state prepares a draft assessment report and drafts of the related materials within 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, preclinical 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.

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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

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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

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these documents specifies the maximum amount of deuterium oxide that we, or our suppliers, are permitted to either import or export. We have obtained two export licenses from the Nuclear Regulatory Commission, each for the export of 20,000 kilograms of heavy water over the life of the license, which are valid until December 2015 and January 2019, and have applied for a third export license from the Nuclear Regulatory Commission. 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, 2014, we had 55 employees, 30 of whom were primarily engaged in research and product development activities. A total of 17 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.

## 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.

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### 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. Our net loss was \$31.7 million, \$6.1 million and \$20.4 million for the years ended December 31, 2014, December 31, 2013 and December 31, 2012, respectively. As of December 31, 2014, we had an accumulated deficit of \$145.3 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. 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 preclinical 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 (deficit) and working capital.

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

- continue to develop and conduct additional non-clinical studies and clinical trials with respect to CTP-354;
- initiate and continue research, non-clinical and clinical development efforts for our other product candidates and potential product candidates;
- seek to identify 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 obtain marketing approval for and 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

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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 a multi-center, international clinical trial, conduct a large-scale pivotal clinical trial, obtain marketing approvals, manufacture a commercial scale product 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 non-clinical 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 non-clinical development efforts for and seek marketing approval for, our 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 ability to obtain debt financing may be limited by covenants we have made under our Loan and Security Agreement with Hercules Technology Growth Capital, Inc., or Hercules, and our pledge to Hercules of substantially all of our assets, other than our intellectual property, as collateral. The negative pledge in favor of Hercules with respect to our intellectual property under the Loan and Security Agreement could further limit our ability to obtain additional debt financing. Our failure to raise capital when needed would have a negative impact on our financial condition and our ability to pursue our business strategy.

We believe our existing cash and cash equivalents and investments as of December 31, 2014 will enable us to fund our operating expenses, debt service and capital expenditure requirements into the second half of 2016,

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without giving effect to potential milestone payments that we may receive under existing collaboration agreements. Our estimate as to how long we expect our existing 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 progress, timing, costs and results of clinical trials of, and research and non-clinical 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 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, restrict our operations 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 and additional collaborations and licensing arrangements. 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 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. For example, our debt facility with Hercules contains restrictive covenants that, among other things and subject to certain exceptions, prohibit us from transferring any of our material assets, merging with or acquiring another entity, entering into a transaction that would result in a change of control, incurring additional indebtedness, creating any lien on our property, making investments in third parties or redeeming stock or paying dividends. Future debt securities or other financing arrangements could contain similar or more restrictive negative covenants.

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.

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### **Our existing and any future indebtedness could adversely affect our ability to operate our business.**

As of December 31, 2014, we had \$7.2 million of outstanding borrowings under our Loan and Security Agreement with Hercules that we are required to repay in monthly installments through October 2015. We could in the future incur additional indebtedness beyond our borrowings from Hercules.

Our outstanding indebtedness combined with our other financial obligations and contractual commitments, including any additional indebtedness beyond our borrowings from Hercules, 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.

In addition, although the rate of interest that we are required to pay under the Loan and Security Agreement is capped, our indebtedness under the Loan and Security Agreement bears interest at a variable rate below that cap, making us vulnerable to increases in the market rate of interest. If the market rate of interest increases substantially, we will have to pay additional interest on this indebtedness, which would reduce cash available for our other business needs.

Failure to make payments or comply with other covenants under our existing debt instruments could result in an event of default and acceleration of amounts due. Under our Loan and Security Agreement with Hercules, the occurrence of an event that would reasonably be expected to have a material adverse effect on our business, operations, assets or condition is an event of default. If an event of default occurs and the lender accelerates the amounts due, we may not be able to make accelerated payments, and the lender could seek to enforce security interests in the collateral securing such indebtedness, which includes substantially all of our assets other than our intellectual property. In addition, the covenants under our existing debt instruments, the pledge of our assets as collateral and the negative pledge with respect to our intellectual property could limit our ability to obtain additional debt financing.

## **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, tolerability or efficacy. 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 later stage clinical trials or in obtaining marketing approval thereafter.



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### **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 population of patients, the occurrence of severe or medically or commercially unacceptable adverse events, failure to comply with protocols or applicable regulatory requirements and determination 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 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. For example, CTP-354 is subject to development risks normally inherent in clinical development because no corresponding non-deuterated compound has been either evaluated in non-clinical toxicology studies or clinically evaluated. While the non-deuterated analog of CTP-354 has been reported to activate the alpha 2, 3 and 5 GABA<sub>A</sub> receptors, which are associated with anti-spasticity, muscle relaxation, anti-anxiety, anti-seizure and, potentially, anti-pain activities, with approximately 40% of the *in vitro* activity of a benzodiazepine, we do not know if the pharmacological profile of CTP-354 will be clinically effective for treating spasticity at doses of CTP-354 that are well tolerated.

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 CTP-354. If we are unable to develop, obtain marketing approval for or commercialize CTP-354, either alone 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 CTP-354 will depend on several factors, including:

- successful completion of non-clinical studies, including toxicology studies and related analysis, including those studies being conducted to further evaluate CTP-354 as a result of toxicology data from a non-clinical *in vivo* study of CTP-354 showing adverse effects;
- successful completion of clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- the performance of our future collaborators for CTP-354, if any;
- the extent of any required post-marketing approval commitments to applicable regulatory authorities;

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- establishment of supply arrangements with third party raw materials suppliers and manufacturers;
- our ability to manufacture or arrange for the manufacture of CTP-354 in sufficient quantities 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 and regulatory exclusivity, both in the United States and internationally;
- amount of commercial sales, if and when approved;
- a continued acceptable safety profile of CTP-354 following any marketing approval;
- commercial acceptance, if and when approved, by patients, the medical community and third party payors; and
- competition with other therapies, including baclofen, tizanidine, benzodiazepines and injected botulinum toxin.

If we are unable to successfully develop, receive marketing approval for, and commercialize CTP-354, 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 non-clinical 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 non-clinical 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, non-clinical 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 non-clinical 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.

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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:

- 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 from the clinical trial, increase the needed enrollment size for the clinical trial or extend the clinical trial's duration;
- 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 non-clinical studies and clinical trials;
- 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; 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 non-clinical tests or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant non-clinical 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

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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;
- efforts to facilitate timely enrollment;
- competing clinical trials; 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 believe we, or our collaborators, may in some instances be able to secure clearances from the FDA or comparable foreign regulatory authorities to use expedited development pathways. However, if we or our collaborators are unable to obtain such clearances, we, or they, may be required to conduct additional non-clinical studies or clinical trials beyond those that we, or they, contemplate, which could increase the expense of obtaining, and delay the receipt of, necessary marketing approvals.**

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 non-clinical studies or clinical trials of the corresponding non-deuterated compounds. For example, our collaborator Avanir reported in June 2013 that the FDA has agreed to an expedited development pathway for AVP-786, a product candidate Avanir is developing that includes our licensed deuterated dextromethorphan compound, permitting Avanir to reference data from its development of dextromethorphan and quinidine in its IND, and any future NDA, for AVP-786.

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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 from the FDA or comparable foreign regulatory authorities. 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.

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 non-clinical 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. While we have been able to reference, for purposes of some of our IND-enabling studies, data generated during development of the corresponding non-deuterated compound, we have not ourselves obtained clearance from the FDA or any comparable foreign regulatory authority to reference such data in connection with more advanced stages of development.

**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 still in non-clinical and early-clinical stage development 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 increased 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.

**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 community. 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.

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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, contained in the product's approved labeling;
- our ability, or the ability of our collaborators, to offer the product for sale at competitive 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;
- 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 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 or seize the drug;
- we, or our collaborators, may be required to recall the drug or change the way the drug is administered;

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- 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 plan 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 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 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.

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### **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, diabetic nephropathy, spasticity, inflammation and cancer, and cystic fibrosis, the key indications for our 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.

Avanir is developing AVP-786 for the treatment of major depressive disorder. Avanir has also reported that it plans to develop AVP-786 for agitation associated with Alzheimer's Disease. There are a number of marketed drugs and product candidates in clinical development for these indications.

We are developing CTP-499 as an additive treatment to the current standard of care for diabetic nephropathy in patients with macroalbuminuria, which is treatment with angiotensin modulators. Angiotensin modulators are available on a generic basis. If CTP-499 receives marketing approval, it may also face competition from a number of product candidates that are currently in clinical development, including potentially competitive product candidates in Phase 3 clinical development being pursued by AbbVie Inc., Janssen Research & Development LLC and NephroGenex, Inc.

We are initially developing CTP-354 for the treatment of spasticity in spinal cord injury and spasticity in multiple sclerosis. Current first-line treatment for spasticity includes oral and local agents and physical and occupational therapy. Four oral drugs have been approved in the United States for the treatment of spasticity: baclofen (Lioresal<sup>®</sup>), tizanidine (Zanaflex<sup>®</sup>), diazepam (Valium) and dantrolene (Dantrium<sup>®</sup>), each of which is available on a generic basis. Spasticity is also treated through localized injections of botulinum toxin. In addition, there are several potentially competitive product candidates in Phase 3 clinical development being pursued by pharmaceutical and biotechnology companies, including GW Pharmaceuticals plc and Osmotica Pharmaceuticals Corp.

JZP-386 is in a Phase 1 clinical trial for the treatment of excessive daytime sleepiness and cataplexy in patients with narcolepsy. The current standard of care is treatment with sodium oxybate. In addition, Flamel Technologies is currently developing an extended release formulation of sodium oxybate for the treatment of narcolepsy.

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, non-clinical 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.



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### **We also face competition in the development of deuterated compounds.**

Several large 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. These large pharmaceutical and biotechnology companies may have significantly greater financial resources and expertise in research and development, manufacturing, non-clinical testing, conducting clinical trials, obtaining marketing approvals and marketing approved products than we do. In addition, we know of one biotechnology company, Auspex Pharmaceuticals, Inc., and possibly two others, DeuteRx LLC and Berolina innovative Research and Development Services Pharma GmbH, that are developing product candidates based on deuterium substitution. These competitors may be more successful than us in developing deuterated compounds. 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 non-clinical 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 may be 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.

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**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 will likely 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 in the same indications. 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.

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.

**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

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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 and are 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; or
- pharmaceutical 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 non-clinical 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.

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### **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;
- 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 will likely be classified as a Schedule I or Schedule III controlled substance, which could substantially limit our 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. We also expect our product candidate CTP-354 will be classified as a Schedule IV controlled substance, which could substantially limit our ability to market and sell CTP-354 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 deuterium-substituted analog of sodium oxybate. 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

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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.

We also expect our product candidate, CTP-354, will be classified as a Schedule IV controlled substance under the CSA. Although the CSA's restrictions governing substances in Schedule IV are not as stringent as those for substances in Schedule III, they too could substantially limit our ability to market and sell CTP-354, if it is approved for marketing.

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 Celgene, Avanir 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;

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- 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 a collaborator for CTP-499 and 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 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 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 for similar indications 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

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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 CTP-499 or our other 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 non-clinical 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 non-clinical 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 non-clinical 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 cGCPs, 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 cGCPs 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 cGCPs, 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 cGCPs. We are also required to register clinical trials and post the results of completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within certain timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

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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 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.

### **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.



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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 non-clinical 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 have only very limited internal capabilities to manufacture our product candidates. We currently rely, and expect to continue to rely, on third party contractors to manufacture non-clinical 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, 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;
- the possible breach by the third party contractors of our agreements with them;
- 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;
- 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.

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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 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 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 cannot successfully 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 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 compounds, are 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.

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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 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, 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

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unenforceable, or that our competitors are competing in a non-infringing manner. Thus, even if we have valid and 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.

### **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 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.

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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.

### **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 and use our DCE Platform without infringing the intellectual property and other proprietary rights of third parties. Some of the non-deuterated compounds on which our product candidates are, or future product candidates may be, based 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. 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.

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 pharmaceutical and biotechnology industries have produced a significant number of patents, and it may not always be clear to industry participants, including us, which patents cover various types of products or methods of use. 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 patent claims of the relevant patent or that the 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 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. However, we are not aware of any judicial proceedings addressing the question of whether our product would be outside the scope of such a patent claim. 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. 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.

**RISKS RELATED TO REGULATORY APPROVAL AND OTHER LEGAL COMPLIANCE MATTERS**

**Even if we complete the necessary non-clinical 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 will prevent us and our collaborators from commercializing the product candidate. 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 non-clinical, clinical or other studies. In addition, varying interpretations of the data obtained from non-clinical 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 countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. 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.

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**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

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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 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.

More recently, 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;



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- 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 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. These 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

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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 making false statements relating to healthcare matters, 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 and teaching hospitals;
- *Controlled Substances Act* . The CSA regulates the handling of controlled substances such as JZP-386 and, potentially, CTP-354; 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 and are generally broad and are enforced by many different federal and state agencies as well as through private actions.

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 and in the future, our operations may involve the use of hazardous and flammable 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.

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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.

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### **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, 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 common 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 of existing or new competitive products or technologies;
- the timing and results of non-clinical studies and clinical trials of any of our product candidates;
- commencement or termination of collaborations for our development programs;
- failure or discontinuation of any of our development programs;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to 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;
- sales of our common stock by us, our insiders or other stockholders;
- 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, if any, that cover our stock;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this “Risk Factors” section.

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### **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 will have 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. 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, 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

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company, and our management and other personnel will need to devote a substantial amount of time towards maintaining compliance with these requirements. These requirements will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. We are currently evaluating these rules and regulations, and cannot predict or estimate the amount of additional costs we may incur or the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. 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.

Our outstanding shares of common stock may be freely sold in the public market at any time to the extent permitted by Rules 144 and 701 under the Securities Act of 1933, as amended, which we refer to as the Securities Act, or to the extent such shares have already been registered under the Securities Act and are held by non-affiliates of ours.

In addition, as of December 31, 2014, there were 2,688,937 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 December 31, 2014, 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, the terms of our

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debt facility with Hercules preclude us from paying dividends, and any future debt agreements may also 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, 2014, our executive officers and directors, combined with our stockholders who owned more than 5% of our outstanding common stock, and their affiliates, in the aggregate, beneficially owned shares representing approximately 44.9% 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.

### **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 stockholder meetings;
- 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

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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 would likely 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.

### **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.

### **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.

	<u>High</u>	<u>Low</u>
<b>Year Ended December 31, 2014</b>		
First Quarter	\$16.26	\$11.42
Second Quarter	13.76	7.12
Third Quarter	15.19	7.50
Fourth Quarter	15.32	10.31

#### **HOLDERS**

As of January 31, 2015, there were 34 holders of record of our common stock. This number does not include beneficial owners whose shares are held by nominees in street name.



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**DIVIDENDS**

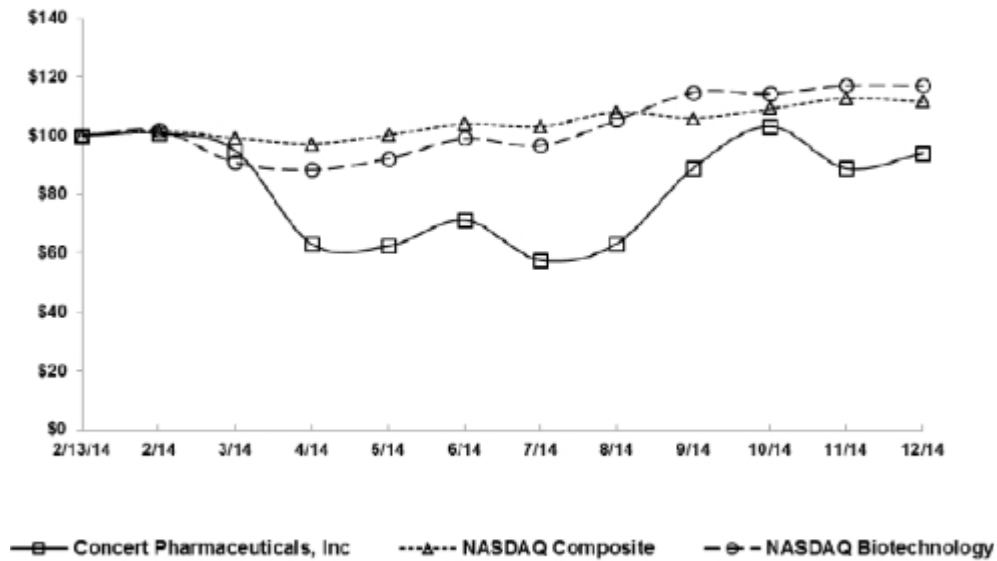
We have never declared or paid any cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. We do not intend to pay any cash dividends to the holders of our common stock in the foreseeable future. Our ability to pay dividends on our common stock is prohibited by the covenants of our debt facility with Hercules and may be further restricted by the terms of any of our future indebtedness.

**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, 2014. 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.

**COMPARISON OF 10 MONTH CUMULATIVE TOTAL RETURN\***  
Among Concert Pharmaceuticals, Inc, the NASDAQ Composite Index  
and the NASDAQ Biotechnology Index



\*\$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.

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### **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.

### **USE OF PROCEEDS FROM REGISTERED SECURITIES**

We effected the initial public offering of our common stock through a Registration Statement on Form S-1 (File No. 333-193335) that was declared effective by the SEC on February 12, 2014, and a registration statement on Form S-1 (File No. 333-193920) filed pursuant to Rule 462(b) of the Securities Act that became effective on February 12, 2014. The net offering proceeds to us, after deducting underwriting discounts and commissions and offering expenses, were approximately \$83.1 million.

As of January 31, 2015, we estimate that we had used approximately \$45.1 million of the net proceeds primarily to fund the development of CTP-354, to advance and expand the research and preclinical development of additional product candidates and for working capital, capital expenditures and other general corporate purposes. None of the net proceeds were paid directly or indirectly to directors or officers of ours or their associates or to persons owning 10 percent or more of our common stock or to any affiliate of ours, other than payments in the ordinary course of business to officers for salaries and to non-employee directors as compensation for board or board committee service. We have invested the balance of the net proceeds from the offering in cash equivalents and other short-term investments in accordance with our investment policy. There has been no material change in our planned use of the balance of the net proceeds from the offering as described in our final prospectus filed with the SEC pursuant to Rule 424(b) under the Securities Act.

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### 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.

(in thousands, except per share data)	Years ended December 31,			
	2014	2013	2012	2011
<b>Revenue:</b>				
License and research and development revenue	\$ 6,576	\$23,408	\$ 11,349	\$ 13,967
Milestone revenue	2,000	2,000	1,500	5,500
Total revenue	<u>8,576</u>	<u>25,408</u>	<u>12,849</u>	<u>19,467</u>
<b>Operating expenses:</b>				
Research and development	\$ 27,474	\$21,790	\$ 24,193	\$ 23,436
General and administrative	11,700	8,028	7,266	7,377
Total operating expenses	<u>39,174</u>	<u>29,818</u>	<u>31,459</u>	<u>30,813</u>
Loss from operations	<u>(30,598)</u>	<u>(4,410)</u>	<u>(18,610)</u>	<u>(11,346)</u>
Investment income	49	21	22	44
Interest and other expense	(1,150)	(1,667)	(1,856)	(18)
Net loss	<u>\$(31,699)</u>	<u>\$(6,056)</u>	<u>\$(20,444)</u>	<u>\$(11,320)</u>
Accretion on redeemable convertible preferred stock	(55)	(396)	(388)	(1,069)
Net loss applicable to common stockholders—basic and diluted	<u>\$(31,754)</u>	<u>\$(6,452)</u>	<u>\$(20,832)</u>	<u>\$(12,389)</u>
Net loss per share applicable to common stockholders—basic and diluted	<u>\$ (2.00)</u>	<u>\$ (4.99)</u>	<u>\$ (16.15)</u>	<u>\$ (9.66)</u>
Weighted-average number of common shares used in net loss per share applicable to common stockholders—basic and diluted	15,842	1,292	1,290	1,283
<b>Consolidated balance sheet data:</b>				
(in thousands)				
Cash and cash equivalents	\$13,396	\$ 9,638	\$ 7,490	\$ 22,949
Investments, available for sale	65,836	23,039	20,067	19,705
Working capital	63,102	18,128	20,940	33,861
Total assets	85,454	39,773	33,129	49,403
Deferred revenue	15,821	19,631	2,750	11,022
Loan payable, net of discount	7,101	14,919	19,731	7,135
Redeemable convertible preferred stock	—	112,244	111,848	111,460
Total stockholders’ equity (deficit)	\$54,825	\$(112,104)	\$(106,687)	\$(86,718)

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### 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. Our approach starts with 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, thereby enhancing clinical safety, tolerability or efficacy. We believe our approach may enable drug discovery and clinical development that is more efficient and less expensive than conventional small molecule drug research and development. We have a robust pipeline of wholly owned and collaboration programs.

The following summarizes our development programs.

- *AVP-786* is a combination of a deuterium-substituted dextromethorphan analog and an ultra-low dose of quinidine being investigated for treatment of neurologic and psychiatric disorders. We granted Avanir Pharmaceuticals, Inc., or Avanir, an exclusive worldwide license to develop and commercialize deuterated dextromethorphan analogs, including the analog in AVP-786. Subsequent to our agreement, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. Avanir is conducting a Phase 2 clinical trial of AVP-786 as an adjunctive treatment for major depressive disorder and also has announced plans to advance AVP-786 into Phase 3 testing for Alzheimer's agitation, following agreement with the United States Food and Drug Administration, or FDA.
- *CTP-499* is a novel, potentially first-in-class treatment for diabetic nephropathy that we are developing as an additive treatment to the current standard of care. We have completed a Phase 2 clinical trial and plan to seek one or more collaborators for future development of CTP-499 in diabetic nephropathy.
- *CTP-354* is a novel, potentially first-in-class, non-sedating treatment for spasticity that we are initially developing for use in patients with spinal cord injury and in patients with multiple sclerosis to address a significant unmet medical need in these markets. We have conducted Phase 1 clinical trials and intend to conduct additional non-clinical studies prior to initiating any Phase 2 clinical testing.
- *CTP-730* is a product candidate for the treatment of inflammatory diseases that is being developed under a collaboration with Celgene Pharmaceuticals, Inc., Celgene International Sarl and Celgene Corporation, together referred to as Celgene, to research, develop and commercialize certain deuterated compounds for the treatment of inflammation or cancer. In September 2014, we announced the initiation of a single ascending dose Phase 1 clinical trial designed to assess the safety, tolerability and pharmacokinetics of CTP-730. The Phase 1 clinical program is designed to also evaluate multiple ascending doses of CTP-730 and is expected to be completed in 2015.
- *JZP-386* is a product candidate containing a deuterated analog of sodium oxybate for potential use in patients with narcolepsy. We have granted Jazz Pharmaceuticals Ireland Limited, or Jazz Pharmaceuticals, worldwide rights to develop and commercialize deuterated sodium oxybate compounds, including JZP-386. Sodium oxybate is the active ingredient in Jazz Pharmaceuticals' marketed drug Xyrem<sup>®</sup>. A second Phase 1 clinical trial evaluating JZP-386 was initiated in the first quarter of 2015 with data expected in the second quarter of 2015 which will inform the next steps in the development of the program.

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- *Deuterated Ivacaftor* is a potential treatment for cystic fibrosis. Cystic fibrosis is a life-threatening, hereditary genetic disease that primarily affects the lungs and digestive system. The cause is a defect in the gene that encodes for cystic fibrosis transmembrane conductance regulator, a protein which regulates components of sweat, mucus and digestion. According to the Cystic Fibrosis Foundation, an estimated 70,000 people worldwide have cystic fibrosis. Many people with the disease can now live into their 30s and beyond. We intend to advance the program into clinical evaluation in 2015.

We plan to continue to seek to identify compounds that can be improved through selective deuterium substitution and believe we are capable of identifying one to two novel deuterated compounds per year that we can advance into preclinical development while concurrently progressing our existing pipeline.

Since our inception in 2006, we have devoted substantially all of our resources to our research and development efforts, including activities to develop our DCE Platform, or deuterated chemical entity platform, and our core capabilities in deuterium chemistry, identify potential product candidates, undertake non-clinical studies and clinical trials, manufacture product 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 \$145.3 million since inception through December 31, 2014 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. In the first quarter of 2014, we completed the sale of 6,649,690 shares of common stock in our initial public offering, or IPO, at a price to the public of \$14.00 per share, resulting in net proceeds to us of \$83.1 million after deducting underwriting discounts and commissions of \$6.5 million and offering costs of \$3.5 million.

We have incurred net losses in each year from our inception in 2006 through 2014. Our net losses were \$31.7 million, \$6.1 million and \$20.4 million for the years ended December 31, 2014, 2013 and 2012, respectively. We do not expect to be profitable for the year ending December 31, 2015. 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 to develop and conduct additional non-clinical studies and clinical trials with respect to CTP-354;
- initiate and continue research, non-clinical and clinical development efforts for our other product candidates and potential product candidates;
- seek to identify 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.

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We do not expect to generate revenue from product sales unless and until we, or our collaborators, successfully complete development and 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. We have developed the internal capability to manufacture up to low kilogram quantities of deuterated active pharmaceutical ingredients for use in Phase 1 clinical trials. However, to date, almost all of our manufacturing activities have been performed by third parties. Additionally, we currently utilize third-party contract research organizations to carry out our clinical development activities and we do not yet have a sales organization. If we obtain, or believe that we are likely to obtain, marketing approval for any of our product candidates for which we retain commercialization rights, 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 and additional collaborations and licensing arrangements 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. They also have provided us with access to the considerable scientific, development, regulatory and commercial capabilities of our collaborators. 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 to seek an expedited development or regulatory pathway by relying on previous clinical data regarding their corresponding non-deuterated compound. For example, our collaborator Avanir reported agreeing with the FDA to an expedited development pathway for AVP-786. 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:

- *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. The collaboration is initially focused on one compound in the initial program, CTP-730, targeting inflammatory disease, but has the potential to encompass up to four programs. For the initial program, we granted Celgene an exclusive worldwide license to develop, manufacture and commercialize deuterated analogs of a selected non-deuterated compound and certain close chemical derivatives thereof. We further granted Celgene licenses with respect to two additional programs and an option with respect to a third additional program. We and Celgene have agreed on the non-deuterated compounds for each of the two additional license programs. For the option program, Celgene may select the non-deuterated compound at a later time, which, unless otherwise agreed by us, will be limited to a compound for which Celgene possesses exclusive rights. With respect to the two additional license programs, we granted Celgene an upfront exclusive worldwide license to develop, manufacture and commercialize deuterated products that contain deuterated analogs of the agreed upon non-deuterated compounds. Celgene is restricted from utilizing their research, development and commercialization rights under each of these upfront licenses, unless, within seven years after the effective date of the agreement, Celgene pays us a license exercise fee. If Celgene does not elect to pay the license exercise fee during the seven year period, the license will expire. With respect to the option program, once a compound is selected, Celgene may exercise its option by paying us an option exercise fee within seven years of the effective date of the agreement, and upon Celgene's exercise of the option we will grant to Celgene an exclusive worldwide license to develop, manufacture and commercialize deuterated products that contain deuterated analogs of the selected non-deuterated compound.

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Under the agreement, we received a non-refundable, upfront payment of \$35.0 million. In addition, we are eligible to earn up to \$23.0 million in development milestone payments, including \$8.0 million related to the completion of Phase 1 clinical trials, 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 initial program. If Celgene exercises its rights with respect to either of the two additional license programs, we 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 we are eligible to receive up to \$100.0 million in sales-based milestone payments based on net sales of products, and with respect to the other additional license program we are eligible to receive up to \$50.0 million in sales-based 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, we 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 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%. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the latest of expiration of specified patent coverage, expiration of regulatory exclusivity or 10 years following commercial launch. 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.

Under the agreement, we are responsible for conducting and funding research and development activities for the initial program at our own expense pursuant to mutually agreed-upon development plans. These activities consist of the completion of single and multiple ascending dose Phase 1 clinical trials and any mutually agreed upon additional 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. 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.

- *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 containing products. Subsequent to our agreement, Avanir was acquired by Otsuka Pharmaceutical Co., Ltd. and it is now a wholly owned subsidiary of Otsuka America, Inc. Avanir is developing AVP-786, which is a combination of a deuterated dextromethorphan analog and an ultra-low dose of quinidine, for the treatment of neurologic and psychiatric disorders.

Under the agreement, we received a non-refundable upfront payment of \$2.0 million, a milestone payment of \$2.0 million in 2013, and a milestone payment of \$2.0 million in 2014. We are also eligible to earn, with respect to licensed products comprising a combination of deuterated dextromethorphan and quinidine, a \$2.0 million milestone payment related to dosing in a Phase 3 clinical trial for AVP-786, up to \$37.0 million in regulatory and commercial launch milestone payments and up to \$125.0 million in sales-based milestone payments. In addition, we are eligible for higher development milestones, up to an additional \$43.0 million, for licensed products that do not require quinidine. Avanir is currently developing deuterated dextromethorphan only in combination with quinidine. Avanir also 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. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the later of expiration of specified patent coverage or 10 years following commercial launch. The royalty rate is

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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.

- *Jazz Pharmaceuticals* . In February 2013, we entered into a development and license agreement with Jazz Pharmaceuticals to research, develop and commercialize products containing deuterated sodium oxybate, or D-SXB. We are initially focusing on one analog, designated as JZP-386. 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, are conducting certain development activities for a Phase 1 clinical trial with respect to JZP-386 pursuant to an agreed upon development plan. We are responsible under the development plan for conducting a Phase 1 clinical trial with respect to JZP-386. Thereafter, our obligations to conduct further development activities are subject to mutual agreement. Jazz Pharmaceuticals has assumed all manufacturing responsibilities. Pursuant to the agreement, our costs for activities under the development plan, including pass-through costs and the costs of our employees' time at a rate per full-time equivalent year of our employees' time, which we mutually agreed to, are reimbursed by Jazz Pharmaceuticals, except for the costs of an additional Phase 1 clinical trial that was initiated in the first quarter of 2015, which will be shared between Jazz Pharmaceuticals and us. This reimbursement is subject to limitations specified in the agreement, including adherence within a particular percentage to the development budget. Under the agreement, Jazz Pharmaceuticals is subject to specified diligence obligations regarding the development and commercialization of licensed products.

Under the agreement, we received a non-refundable upfront payment of \$4.0 million and we are also 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 sales of licensed products. 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 a country-by-country and licensed product-by-licensed product basis, on net sales of licensed products. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the later of the expiration of specified patent coverage or 10 years following commercial launch. The royalty rate is lowered, on a country-by-country basis, under certain circumstances as specified in the agreement.

Following termination of the agreement with respect to a country or countries, but not in its entirety, by Jazz Pharmaceuticals for Jazz Pharmaceuticals' convenience, Jazz Pharmaceuticals may provide us written notice that it desires to continue or recommence development and commercialization of licensed products in such country or countries, in which event Jazz Pharmaceuticals' license with respect to D-SXB products in such country or countries and corresponding payment obligations under the agreement will be reinstated except in specified circumstances in which we have previously notified Jazz Pharmaceuticals of our intent to develop or commercialize licensed products in such country or countries either directly or through a third party licensee.

- *Fast Forward LLC* . In addition to these collaborations, in February 2012, we entered into a sponsored research agreement with Fast Forward LLC, or Fast Forward, a subsidiary of the National Multiple Sclerosis Society, to fund the preclinical advancement of CTP-354. Under the Fast Forward agreement, we received a non-refundable upfront payment of \$0.2 million, as well as further non-refundable payments of \$0.6 million for the achievement of the preclinical development milestones set forth in the agreement. We are obligated to make milestone payments to Fast Forward not in excess of a low-single digit multiple of the funding amount if we commercialize CTP-354 or license the development and commercialization of CTP-354 to a third party.
- *Glaxo Group Limited* . In May 2009, we 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. Our agreement with GSK, as subsequently amended, expired in May 2012 after GSK opted out of further development under the agreement and made a



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\$2.75 million payment to us. The rights to the product candidates developed under the agreement have reverted to us and we are free to pursue them without further obligation to GSK other than to repay GSK an amount of up to \$2.75 million if we commercialize CTP-499 or if, prior to a specified date in 2018, we re-license or transfer rights to CTP-499 to a third party.

## 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.

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 and certain research and development service revenues. 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 future product sales in connection with our current collaborations with Celgene, Avanir 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 consist of 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 non-clinical 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

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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;
- 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, market, commercialize and achieve market acceptance for 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.

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, primarily due to the increased size and duration of 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.

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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.

### Interest and other expense

Interest and other expense consists primarily of interest expense on amounts outstanding under our debt facility with Hercules, amortization of debt discount and the re-measurement gain or loss associated with the change in the fair value of the preferred stock warrant liability.

## 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 under different assumptions or conditions. 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.

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*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

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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 ratably 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. 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 ending date.

*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

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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 non-clinical 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 all stock-based compensation. 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 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.

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.

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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.

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

(in thousands)	Years ended December 31,		
	2014	2013	2012
Research and development	\$ 802	\$ 583	\$ 564
General and administrative	891	420	304
Total	<u>\$1,693</u>	<u>\$ 1,003</u>	<u>\$ 868</u>

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,		
	2014	2013	2012
Expected volatility	80.94%	70.10%	72.80%
Expected term	6.0 years	6.0 years	6.0 years
Risk-free interest rate	1.90%	1.69%	0.95%
Expected dividend yield	0.00%	0.00%	0.00%

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.

## PENDING 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 retrospectively beginning in the first quarter of fiscal 2017 with early adoption not permitted. We are currently assessing the impact of this ASU on our consolidated financial statements.

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 ASC 205-40 *Presentation of Financial Statements – Going Concern*, by providing guidance on determining when and how reporting entities

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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. ASU 2014-15 will be effective for our fiscal year 2016 and for interim periods beginning in the first quarter of fiscal 2017. We are still evaluating the impact of this ASU on our financial statement disclosures.

## RESULTS OF OPERATIONS

### Comparison of the years ended December 31, 2014 and 2013

The following table summarizes our results of operations for the years ended December 31, 2014 and 2013, together with the changes in those items in dollars.

(in thousands)	Year ended December 31,		Change
	2014	2013	
Revenue:			
License and research and development revenue	\$ 6,576	\$ 23,408	\$(16,832)
Milestone revenue	2,000	2,000	—
Total revenue	8,576	25,408	(16,832)
Operating expenses:			
Research and development	27,474	21,790	5,684
General and administrative	11,700	8,028	3,672
Total operating expenses	39,174	29,818	9,356
Loss from operations	(30,598)	(4,410)	(26,188)
Investment income	49	21	28
Interest and other expense	(1,150)	(1,667)	517
Net loss	<u>\$ (31,699)</u>	<u>\$ (6,056)</u>	<u>\$(25,643)</u>

### Revenue

Revenue was \$8.6 million for the year ended December 31, 2014, compared to \$25.4 million for the year ended December 31, 2013, a decrease of \$16.8 million. The decrease in revenue was primarily due to license revenue recognized during the year ended December 31, 2013 of \$17.0 million in connection with the initial license deliverable under our collaboration agreement with Celgene, partially offset by an increase of \$2.4 million recognized for services performed under our Celgene agreement during the year ended December 31, 2014. The increase in services performed during the year ended December 31, 2014 was primarily attributable to the initiation of a single ascending dose Phase 1 clinical trial of CTP-730 during the year ended December 31, 2014.

Additionally, revenue recognized under our Jazz Pharmaceuticals collaboration decreased by \$2.2 million, primarily as a result of the \$3.7 million recognized for the license deliverable during the year ended December 31, 2013, partially offset by a \$1.5 million increase in revenue recognized during the year ended December 31, 2014 for services performed under our Jazz Pharmaceuticals agreement. The increase in services performed during the year ended December 31, 2014 was primarily attributable to the conduct of a Phase 1 clinical trial of JZP-386 during the year ended December 31, 2014.

As of December 31, 2014, we had deferred revenue of:

- \$12.9 million related to our collaboration with Celgene, \$5.8 million of which is classified as current and \$7.1 million of which is classified as long-term, on our consolidated balance sheet;



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- \$0.2 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.

### *Research and development expenses*

The following table summarizes our external research and development expenses, by program, for the years ended December 31, 2014 and 2013, 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.

<u>(in thousands)</u>	<u>Year ended December 31,</u>	
	<u>2014</u>	<u>2013</u>
Direct research and development expenses:		
CTP-499	\$ 1,377	\$ 3,903
CTP-354	5,921	1,771
JZP-386	2,207	253
CTP-730	1,904	455
Total direct research and development expenses	11,409	6,382
Employee and contractor-related expenses	10,523	10,723
Platform-related lab expenses	2,459	1,395
Facility expenses	2,742	2,802
Other expenses	341	488
Personnel and other expenses	16,065	15,408
Total research and development expenses	<u>\$ 27,474</u>	<u>\$ 21,790</u>

Research and development expenses were \$27.5 million for the year ended December 31, 2014, compared to \$21.8 million for the year ended December 31, 2013, an increase of \$5.7 million. The increase was primarily due to a \$4.2 million increase in CTP-354 expenses due to the conduct of Phase 1 clinical trials and other non-clinical development activities, a \$2.0 million increase in JZP-386 expenses as a result of the conduct of a Phase 1 clinical trial and an increase of \$1.4 million in CTP-730 expenses which was primarily attributable to the initiation of a Phase 1 clinical trial as well as certain non-clinical development activities. These increases were partially offset by a \$2.5 million decrease in CTP-499 expense due to the completion of dosing for the second part of our Phase 2 clinical trial in December 2013, partially offset by costs incurred during the year ended December 31, 2014 associated with the open-label extension study that was the final part of Phase 2 clinical trial.

The \$1.1 million increase in platform-related lab expenses was primarily associated with certain ongoing research programs.

### *General and administrative expenses*

General and administrative expenses were \$11.7 million for the year ended December 31, 2014, compared to general and administrative expenses of \$8.0 million for the year ended December 31, 2013. The increase was primarily due to a \$2.0 million increase in cash compensation and non-cash stock-based compensation expense and recruiting expense, a \$1.3 million increase of expenses incurred during the year ended December 31, 2014 in connection with our becoming a public company, including directors and officers insurance premiums and professional fees, and a \$0.2 million increase in rent and facility expense, which was partially attributable to the lease amendment executed in August 2014 as well as an increase in higher facility operating expenses.

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### *Interest and other expense*

Interest and other expense was \$1.2 million for the year ended December 31, 2014, compared to \$1.7 million for the year ended December 31, 2013. The decrease was primarily attributable to a decrease in interest expense associated with our debt facility with Hercules, which decreased by \$0.6 million for the year ended December 31, 2014 compared to the prior year due to a lower principal balance outstanding. The decrease was partially offset by a \$0.1 million increase in expense 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.

### **Comparison of the years ended December 31, 2013 and 2012**

The following table summarizes our results of operations for the years ended December 31, 2013 and 2012, together with the changes in those items in dollars.

<u>(in thousands)</u>	<u>Year ended December 31,</u>		<u>Change</u>
	<u>2013</u>	<u>2012</u>	
<b>Revenue:</b>			
License and research and development revenue	\$ 23,408	\$ 11,349	\$12,059
Milestone revenue	2,000	1,500	500
Total revenue	25,408	12,849	12,559
<b>Operating expenses:</b>			
Research and development	21,790	24,193	(2,403)
General and administrative	8,028	7,266	762
Total operating expenses	29,818	31,459	(1,641)
Loss from operations	(4,410)	(18,610)	14,200
Investment income	21	22	(1)
Interest and other expense	(1,667)	(1,856)	189
Net loss	<u>\$ (6,056)</u>	<u>\$ (20,444)</u>	<u>\$14,388</u>

### *Revenue*

Revenue was \$25.4 million for the year ended December 31, 2013, compared to \$12.8 million for the year ended December 31, 2012, an increase of \$12.6 million. The increase in revenue was primarily due to license revenue recognized for the year ended December 31, 2013 of \$17.0 million under our collaboration with Celgene and \$3.7 million under our collaboration with Jazz Pharmaceuticals, in connection with our grant of licenses under these collaborations, as well as \$2.0 million of milestone revenue recognized for the year ended December 31, 2013 based on positive data from Avanir's Phase 1 clinical trial of AVP-786. In comparison, we recognized revenue for the year ended December 31, 2012 comprised primarily of \$8.3 million of research and development revenue and \$1.5 million of milestone revenue under our collaboration with GSK, which ended in 2012. We recognized license revenue of \$2.0 million in the year ended December 31, 2012 relating to the license grant to Avanir for deuterated dextromethorphan. In addition, an increase of \$1.7 million in revenue recognized for services performed under our collaborations contributed to the overall increase in revenue for the year ended December 31, 2013 as compared to the prior year, of which \$1.4 million was related to services performed under our collaboration with Celgene.

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### Research and development expenses

The following table summarizes our external research and development expenses, by program, for the years ended December 31, 2013 and 2012, 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.

(in thousands)	Year ended December 31,	
	2013	2012
Direct research and development expenses:		
CTP-499	\$ 3,903	\$ 5,967
CTP-354	1,771	1,091
JZP-386	253	53
CTP-730	455	19
Total direct research and development expenses	6,382	7,130
Employee and contractor-related expenses	10,723	9,031
Platform-related lab expenses	1,395	4,676
Facility expenses	2,802	2,833
Other expenses	488	523
Personnel and other expenses	15,408	17,063
Total research and development expenses	\$ 21,790	\$ 24,193

Research and development expenses were \$21.8 million for the year ended December 31, 2013, compared to \$24.2 million for the year ended December 31, 2012, a decrease of \$2.4 million. The decrease was primarily due to a \$2.1 million decrease in CTP-499 expenses due to the completion of a preclinical toxicology study in August 2012 and subjects completing the Phase 2 clinical trial during the year ended December 31, 2013, a \$3.3 million decrease in platform-related laboratory expenses, which was partially attributable to a \$1.5 million decrease in expenses due to the completion of a Phase 1 clinical trial in May 2012.

These decreases were partially offset by a \$1.7 million increase in employee and contractor-related expenses that were primarily a result of \$0.9 million increase for employee bonuses earned, \$0.4 million increase for severance obligations due to a former employee and \$0.3 million increase due to greater engagement of clinical consultants during the year ended December 31, 2013. In addition, the decreases were further offset by a \$0.7 million increase in CTP-354 expenses upon the initiation of Phase 1 clinical trials, \$0.4 million increase in CTP-730 expense under our collaboration with Celgene and a \$0.2 million increase in JZP-386 expense under our collaboration with Jazz Pharmaceuticals during the year ended December 31, 2013.

### General and administrative expenses

General and administrative expenses were \$8.0 million for the year ended December 31, 2013, compared to general and administrative expenses of \$7.3 million for the year ended December 31, 2012. The increase was primarily due to a \$0.4 million increase in compensation expense relating to employee bonuses and \$0.3 million increase in professional fees primarily related to market research for our product candidates.

### Interest and other expense

Interest and other expense was an expense of \$1.7 million for the year ended December 31, 2013, which was comparable to an expense of \$1.9 million for the year ended December 31, 2012. Expense recognized 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 decreased by \$0.3 million for the year

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ended December 31, 2013 compared to the prior period. The decrease was offset by an increase of \$0.1 million in interest expense associated with \$12.5 million of principal that we drew under our debt facility with Hercules in March 2012.

### 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, 2014, we had an accumulated deficit of \$145.3 million. 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 and additional collaborations and licensing arrangements.

We have financed our operations to date primarily through the public offering and private placement of our equity, debt financing and funding from collaborations. As of December 31, 2014 we had cash and cash equivalents and investments of \$79.2 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:

(in thousands)	Year ended December 31,		
	2014	2013	2012
Net cash provided by (used in):			
Operating activities	\$(29,760)	\$13,018	\$(26,427)
Investing activities	(44,452)	(3,637)	(1,200)
Financing activities	77,970	(7,233)	12,168
Net increase (decrease) in cash and cash equivalents	<u>\$ 3,758</u>	<u>\$ 2,148</u>	<u>\$(15,459)</u>

#### Comparison of the years ended December 31, 2014, 2013 and 2012

*Operating activities.* During the years ended December 31, 2014, 2013 and 2012, our operating activities used cash of \$29.8 million, provided cash of \$13.0 million and used cash of \$26.4 million, respectively. 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, 2013 was primarily due to receipt of non-refundable upfront payments of \$35.0 million and \$4.0 related to our collaborations with Celgene and Jazz Pharmaceuticals, respectively, in the year ended December 31, 2013. The increase in cash used during the year ended December 31, 2014 as compared to the years ended December 31, 2013 and 2012 was primarily attributable to increased operating expenses, adjusted for non-cash items, which were due to increased research development activities as well as higher general and administrative expenses as a result of operating as a public company during the year ended December 31, 2014.

*Investing activities.* Net cash used in investing activities consisted of purchases of investments, purchases of fixed assets and proceeds from the maturity of investments. Net cash used in purchases of investments for the years ended December 31, 2014, 2013 and 2012 was \$89.2 million, \$29.9 million and \$38.4 million, respectively. Net cash provided by maturities of investments for the years ended December 31, 2014, 2013 and 2012 was \$45.5 million, \$26.7 million and \$37.7 million, respectively. Purchases of fixed assets during the years ended December 31, 2014, 2013 and 2012 were \$0.8 million, \$0.4 million and \$0.5 million, respectively. The increase in cash used in investing activities for the year ended December 31, 2014 as compared to the years

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ended December 31, 2013 and 2012 was primarily related to the investment of our IPO proceeds. The increase in cash used in purchases of fixed assets for the year ended December 31, 2014 as compared to the years ended December 31, 2013 and 2012 was partially due to additional management information systems and infrastructure necessary to operate as a public company as well as to support our product development pipeline.

*Financing activities.* During the years ended December 31, 2014, 2013 and 2012, our financing activities provided cash of \$78.0 million, used cash of \$7.2 million and provided cash of \$12.2 million, respectively. The cash provided by financing activities during the year ended December 31, 2014 was primarily due to the receipt of IPO proceeds (net of underwriting discounts and commissions but prior to deducting other transaction expenses) of \$86.6 million. Cash payments of IPO related expenses totaled \$1.4 million and \$2.0 million during the years ended December 31, 2014 and 2013, respectively. Principal payments under our debt facility with Hercules totaled \$7.9 million, \$4.9 million and \$0 during the years ended December 31, 2014, 2013 and 2012, respectively. Additionally, proceeds from the issuance of debt under our debt facility with Hercules totaled \$12.5 million during the year ended December 31, 2012. Proceeds from the issuance of common stock in connection with the exercise of stock options totaled \$1.0 million, \$32 thousand and \$0 during the years ended December 31, 2014, 2013 and 2012, respectively.

### 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. As of December 31, 2014, an aggregate of \$7.2 million of principal and accrued interest remained outstanding under the Loan and Security Agreement.

Each advance under the Loan and Security Agreement bears interest at a variable rate equal to the greater of 8.5% and an amount equal to 8.5% plus the prime rate of interest minus 5.25%, provided however that the per annum rate of interest rate shall not exceed 11%. We were required to pay interest only on the indebtedness through April 30, 2013. We are now repaying our remaining indebtedness under the Loan and Security Agreement in 10 equal monthly payments of principal and interest of \$0.7 million through October 1, 2015.

The loan is collateralized by a blanket lien on all of our corporate assets, excluding intellectual property, and by a negative pledge on our intellectual property. The Loan and Security Agreement contains default provisions that include the occurrence of a material adverse effect, as defined therein, that would entitle the lender to declare all principal, interest and other amounts owed by us under the Loan and Security Agreement immediately due and payable. We do not believe that any events have occurred that could reasonably be deemed to have a material adverse effect. We do not have any financial covenants under the Loan and Security Agreement.

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. 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

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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, 2014, will enable us to fund our operating expenses, debt service and capital expenditure requirements into the second half of 2016, without giving effect to potential milestone payments that we may receive under existing collaboration agreements. However, we may 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. 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 are subject to covenants under our existing loan and security agreement with Hercules, and 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. In addition, the pledge of substantially all of our assets with the exception of our intellectual property as collateral, and the negative pledge with respect to our intellectual property, under our debt facility with Hercules limit our ability to obtain additional debt financing.

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**

In August 2014, we entered into an amendment of lease for our headquarters in Lexington, Massachusetts, pursuant to which we will lease through September 30, 2018 the approximately 45,000 square feet of office and laboratory space that was covered by the lease prior to the amendment as well as an additional 5,000 square feet of office space. A tenant improvement allowance of \$0.4 million was provided by the landlord under the amendment for general improvements. The amendment also provided for the waiver of the remaining monthly

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payments due under our outstanding leasehold improvement loan, totaling \$0.3 million as of December 31, 2014, and a reduction in the letter of credit we delivered under the lease from \$0.7 million to \$0.4 million. Waiver of the leasehold improvement loan will occur on a monthly basis from October 1, 2014 through September 30, 2015 and was considered to represent a lease incentive. Accordingly, the remaining principal balance of the leasehold improvement loan as of December 31, 2014 has been classified as a component deferred lease incentive in our consolidated balance sheet and will be recognized over the remainder of the extended lease term.

The following table summarizes our contractual obligations at December 31, 2014:

<u>(in thousands)</u>	<u>Total</u>	Less than	1 to 3	3 to 5	More than
		<u>1 year</u>	<u>years</u>	<u>years</u>	<u>5 years</u>
Long-term debt obligations <sup>(1)</sup>	\$ 7,462	\$ 7,462	\$ —	\$ —	\$ —
Operating lease obligations <sup>(2)</sup>	5,843	1,540	3,095	1,208	—
Total contractual obligations	<u>\$13,305</u>	<u>\$ 9,002</u>	<u>\$3,095</u>	<u>\$1,208</u>	<u>\$ —</u>

- (1) Consists of payment obligations for principal and interest under our debt facility with Hercules. As of December 31, 2014, we had \$7.2 million in outstanding borrowings under the debt facility, bearing interest at a variable rate of the greater of 8.5% and an amount equal to 8.5% plus the prime rate of interest minus 5.25%, subject to a cap of 11%. Under the terms of the loan and security agreement governing the debt facility, we were required to pay interest only through April 30, 2013, which from January 1, 2013 to April 30, 2013 consisted of monthly payments of \$0.1 million. Following April 30, 2013, we are required to repay this indebtedness in equal monthly payments of \$0.7 million through October 1, 2015. The loans under the debt facility are collateralized by a lien on substantially all of our corporate assets, excluding intellectual property, which is subject to a negative pledge under the loan and security agreement. The loan and security agreement contains default provisions that include the occurrence of a material adverse effect, as defined therein, that would entitle the lender to declare all principal, interest and other amounts owed by us under the loan and security agreement immediately due and payable.
- (2) 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 also have obligations to make future payments to third parties that become due and payable on the achievement of certain development, regulatory and commercial milestones, such as the start of a clinical trial, filing of an NDA, approval by the FDA or product launch. We have not included these commitments on our balance sheet or in the table above because the achievement and timing of these milestones is not fixed and determinable. These commitments include:

- An obligation to make a payment to GSK of up to \$2.8 million if we commercialize CTP-499 or if, prior to a specified date in 2018, we re-license or transfer rights to our CTP-499 program prior to a specified date in 2018.
- Obligations to make milestone payments to Fast Forward not in excess of a low-single digit multiple of the \$0.8 million Fast Forward funding amount if we commercialize CTP-354 or license the development and commercialization of CTP-354 to a third party.

We enter into contracts in the normal course of business with contract research organizations for preclinical research studies, 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.

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### ITEM 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risk related to changes in interest rates. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments are in short-term available-for-sale securities and interest on our debt facility accrues at a variable rate that references the prime rate.

We had cash and cash equivalents and investments of \$79.2 million as of December 31, 2014 and \$32.7 million as of December 31, 2013, in each case primarily money market mutual funds and available-for-sale securities consisting of U.S. government-backed and agency securities. The increase in cash and cash equivalents and investments during the year ended December 31, 2014 was primarily the result of our receipt of IPO proceeds of \$86.6 million (net of underwriting discount and commissions but prior to deducting other transaction expenses) in February 2014. Our available-for-sale securities are subject to interest rate risk and will fall in value if market interest rates increase. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our portfolio.

We had outstanding borrowings under our debt facility with Hercules of \$7.2 million as of December 31, 2014 and \$15.1 million as of December 31, 2013. Interest is payable at a variable rate of the greater of 8.5% and an amount equal to 8.5% plus the prime rate of interest minus 5.25%, provided however, that the per annum interest rate shall not exceed 11%. As a result of the 11% maximum annual interest rate and interest rate protection until prime exceeds 5.25%, we have limited exposure to changes in interest rates on borrowings under this facility. A hypothetical 100 basis point increase in the prime rate as of December 31, 2014 would have no effect on the amount of our required interest payments under the debt facility through maturity on October 1, 2015.

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, 2014, 2013 and 2012.



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**Table of Contents****ITEM 8. Financial Statements and Supplementary Data****INDEX TO FINANCIAL STATEMENTS**

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### 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, 2014 and 2013, and the related consolidated statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' equity (deficit), and cash flows for each of the three years in the period ended December 31, 2014. 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, 2014 and 2013, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2014, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Boston, Massachusetts  
March 2, 2015

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### CONCERT PHARMACEUTICALS, INC.

#### CONSOLIDATED BALANCE SHEETS

	December 31,	
	2014	2013
(Amounts in thousands, except share and per share data)		
<b>Assets</b>		
Current assets:		
Cash and cash equivalents	\$ 13,396	\$ 9,638
Investments, available for sale	65,836	23,039
Interest receivable	262	92
Accounts receivable	1,021	170
Prepaid expenses and other current assets	1,205	1,106
Total current assets	81,720	34,045
Property and equipment, net	2,284	2,473
Restricted cash	400	706
Other assets	50	2,549
Total assets	<u>\$ 84,454</u>	<u>\$ 39,773</u>
<b>Liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)</b>		
Current liabilities:		
Accounts payable	\$ 560	\$ 971
Accrued expenses and other liabilities	5,002	2,475
Deferred revenue, current portion	5,955	4,321
Leasehold improvement loan, current portion	—	332
Loan payable, net of discount	7,101	7,818
Total current liabilities	18,618	15,917
Deferred revenue, net of current portion	9,866	15,310
Leasehold improvement loan, net of current portion	—	249
Deferred lease incentive, net of current portion	888	385
Deferred rent, net of current portion	257	208
Warrant to purchase redeemable securities	—	463
Loan payable, net of current portion and discount	—	7,101
Total liabilities	29,629	39,633
Commitments		
Redeemable convertible preferred stock; \$0.001 par value per share; 0 and 62,916,667 shares (Series A, B, C, D) authorized, 0 and 56,047,067 shares issued and outstanding in 2014 and 2013, respectively	—	112,244
Stockholders' equity (deficit):		
Preferred stock, \$0.001 par value per share; 5,000,000 shares authorized, no shares issued and outstanding in 2014	—	—
Common stock, \$0.001 par value per share; 100,000,000 and 83,716,667 shares authorized, 18,234,068 and 1,298,300 shares issued and outstanding in 2014 and 2013, respectively	18	1
Additional paid-in capital	200,157	1,528
Accumulated other comprehensive income	(14)	4
Accumulated deficit	(145,336)	(113,637)
Total stockholders' equity (deficit)	54,825	(112,104)
Total liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)	<u>\$ 84,454</u>	<u>\$ 39,773</u>

See accompanying notes.

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### CONCERT PHARMACEUTICALS, INC.

#### CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

	Year ended December 31,		
	2014	2013	2012
	(Amounts in thousands, except per share data)		
Revenue:			
License and research and development revenue	\$ 6,576	\$23,408	\$ 11,349
Milestone revenue	2,000	2,000	1,500
Total revenue	<u>8,576</u>	<u>25,408</u>	<u>12,849</u>
Operating expenses:			
Research and development	27,474	21,790	24,193
General and administrative	11,700	8,028	7,266
Total operating expenses	<u>39,174</u>	<u>29,818</u>	<u>31,459</u>
Loss from operations	<u>(30,598)</u>	<u>(4,410)</u>	<u>(18,610)</u>
Investment income	49	21	22
Interest and other expense	<u>(1,150)</u>	<u>(1,667)</u>	<u>(1,856)</u>
Net loss	<u><u>\$(31,699)</u></u>	<u><u>\$(6,056)</u></u>	<u><u>\$(20,444)</u></u>
Other comprehensive loss:			
Unrealized loss on investments	(18)	—	(5)
Comprehensive loss	<u><u>\$(31,717)</u></u>	<u><u>\$(6,056)</u></u>	<u><u>\$(20,449)</u></u>
Reconciliation of net loss to net loss applicable to common stockholders:			
Net loss	<u>\$(31,699)</u>	<u>\$(6,056)</u>	<u>\$(20,444)</u>
Accretion on redeemable convertible preferred stock	(55)	(396)	(388)
Net loss applicable to common stockholders—basic and diluted	<u><u>\$(31,754)</u></u>	<u><u>\$(6,452)</u></u>	<u><u>\$(20,832)</u></u>
Net loss per share applicable to common stockholders—basic and diluted	<u><u>\$ (2.00)</u></u>	<u><u>\$ (4.99)</u></u>	<u><u>\$ (16.15)</u></u>
Weighted-average number of common shares used in net loss per share applicable to common stockholders—basic and diluted	15,842	1,292	1,290

See accompanying notes.

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### 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)
	Carrying		Shares	Amount				
	Shares	value			Shares	Amount		
	(in thousands, except share data)							
Balance at December 31, 2011	56,047,067	\$ 111,460	1,290,238	\$ 1	\$ 409	\$ 9	\$ (87,137)	\$ (86,718)
Accretion of redeemable convertible preferred stock to redemption value		388	—	—	(388)	—	—	(388)
Unrealized gain on short-term investments	—	—	—	—	—	(5)	—	(5)
Stock-based compensation expense	—	—	—	—	868	—	—	868
Net loss	—	—	—	—	—	—	(20,444)	(20,444)
Balance at December 31, 2012	56,047,067	\$ 111,848	1,290,238	\$ 1	\$ 889	\$ 4	\$ (107,581)	\$ (106,687)
Accretion of redeemable convertible preferred stock to redemption value	—	396	—	—	(396)	—	—	(396)
Exercise of stock options	—	—	8,062	—	32	—	—	32
Stock-based compensation expense	—	—	—	—	1,003	—	—	1,003
Net loss	—	—	—	—	—	—	(6,056)	(6,056)
Balance at December 31, 2013	56,047,067	\$ 112,244	1,298,300	\$ 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	—	—	6,649,690	7	83,112	—	—	83,119
Conversion of preferred stock into common stock	(56,047,067)	(112,299)	9,919,821	10	112,289	—	—	112,299
Reclassification of warrant	—	—	—	—	581	—	—	581
Exercise of stock options	—	—	366,257	—	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	—	\$ —	18,234,068	\$ 18	\$ 200,157	\$ (14)	\$ (145,336)	\$ 54,825

See accompanying notes.

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### CONCERT PHARMACEUTICALS, INC.

#### CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year ended December 31,		
	2014	2013 (in thousands)	2012
<b>Operating activities</b>			
Net loss	\$(31,699)	\$ (6,056)	\$(20,444)
Adjustments to reconcile net loss to net cash (used in) provided by operating activities:			
Depreciation and amortization	1,052	1,346	1,452
Stock-based compensation expense	1,693	1,003	868
Accretion of premiums and discounts on investments	833	302	365
Amortization of discount on loan payable	98	97	96
Amortization of deferred financing costs	38	38	39
Re-measurement of warrant to purchase redeemable securities	117	4	291
Amortization of deferred lease incentive	(367)	(513)	(513)
Changes in operating assets and liabilities:			
Accounts receivable	(851)	(157)	487
Interest receivable	(170)	10	26
Prepaid expenses and other current assets	(137)	32	(364)
Restricted cash	306	—	—
Other assets	82	69	5
Accounts payable	(32)	158	(764)
Accrued expenses and other liabilities	2,863	(15)	432
Landlord lease incentive	350	—	—
Deferred rent	(126)	(181)	(131)
Deferred revenue	(3,810)	16,881	(8,272)
Net cash (used in) provided by operating activities	(29,760)	13,018	(26,427)
<b>Investing activities</b>			
Purchases of property and equipment	(804)	(363)	(468)
Purchases of investments	(89,188)	(29,929)	(38,398)
Maturities of investments	45,540	26,655	37,666
Net cash used in investing activities	(44,452)	(3,637)	(1,200)
<b>Financing activities</b>			
Proceeds from issuance of loan payable, net of issuance costs	—	—	12,500
Principal payments on loan payable	(7,916)	(4,909)	—
Repayment of leasehold improvement loan	(266)	(332)	(332)
Proceeds from initial public offering, net of underwriting discounts and commissions	86,579	—	—
Proceeds from issuance of common stock	1,009	32	—
Payment of initial public offering costs	(1,436)	(2,024)	—
Net cash provided by (used in) financing activities	77,970	(7,233)	12,168
Net increase (decrease) in cash and cash equivalents	3,758	2,148	(15,459)
Cash and cash equivalents at beginning of period	9,638	7,490	22,949
Cash and cash equivalents at end of period	\$ 13,396	\$ 9,638	\$ 7,490
Supplemental cash flow information:			
Cash paid for interest	\$ 992	\$ 1,601	\$ 1,339
Property and equipment included in accrued expenses and other liabilities	\$ 60	\$ —	\$ —
Initial public offering costs incurred but unpaid at period end	\$ —	\$ 475	\$ —

See accompanying notes.

**CONCERT PHARMACEUTICALS, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS****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 starts with approved drugs, advanced clinical candidates or previously studied compounds 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 five clinical-stage candidates and a number of preclinical compounds that it is actively assessing.

In the first quarter of 2014, the Company closed its initial public offering, or IPO, in which the Company sold 6,649,690 shares of common stock, including shares sold under the underwriters' over-allotment option, at a price to the public of \$14.00 per share. The Company's net proceeds from the IPO were \$83.1 million after deducting underwriting discounts and commissions and offering expenses. In preparation for the IPO, the Company's Board of Directors and stockholders approved a one-for-5.65 reverse stock split of the Company's common stock that was effected on January 29, 2014. All share and per share amounts in the consolidated financial statements and notes thereto have been retroactively adjusted, where necessary, to give effect to this reverse stock split. In conjunction with the IPO, all outstanding shares of the Company's preferred stock automatically converted into 9,919,821 shares of common stock and the outstanding warrant to purchase 400,000 shares of Series C redeemable convertible preferred stock converted into a warrant to purchase 70,796 shares of common stock at an exercise price of \$14.13 per share. As of December 31, 2014, there were 18,234,068 shares of common stock outstanding. The significant increase in shares of common stock outstanding in the first quarter of 2014 is expected to impact the year-over-year comparability of the Company's net earnings (loss) per share calculations until the first quarter of 2015.

The Company had cash and cash equivalents and investments of \$79.2 million at December 31, 2014. The Company believes that its existing cash and cash equivalents and investments will be sufficient to allow the Company to fund its current operating plan for at least the next 12 months. Management expects the Company to continue to incur losses for the foreseeable future. The Company's ability to achieve profitability in the future is dependent upon the successful development, approval, and commercialization of its product candidates and achieving a level of revenues adequate to support the Company's cost structure. The Company may never achieve profitability, and unless and until it does, the Company will continue to need to raise additional capital. Management intends to fund future operations through additional private or public debt or equity offerings, and may seek additional capital through arrangements with collaborators or from other sources. There can be no assurances, however, that additional funding will be available on terms acceptable to the Company, or at all.

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

**2. Basis of Presentation and Significant Accounting Policies**

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 material 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 subsidiary, Concert Pharmaceuticals Securities Corporation, which is a Massachusetts subsidiary created to buy, sell and hold securities. All intercompany transactions and balances have been eliminated.

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

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.

#### 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. Premiums or discounts from par value are amortized to investment income over the life of the underlying investment.

Cash, cash equivalents and investments included the following at December 31, 2014 and 2013 (in thousands):

	<u>Average maturity</u>	<u>Amortized cost</u>	<u>Unrealized gains</u>	<u>Unrealized losses</u>	<u>Fair value</u>
<b>December 31, 2014</b>					
Cash		\$ 1,492	\$ —	\$ —	\$ 1,492
Money market funds		11,904	—	—	11,904
Cash and cash equivalents		<u>\$ 13,396</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$13,396</u>
U.S. Treasury obligations	171 days	\$ 12,037	\$ (2)	\$ —	\$12,035
Government agency securities	194 days	53,813	3	(15)	53,801
Investments		<u>\$ 65,850</u>	<u>\$ 1</u>	<u>\$ (15)</u>	<u>\$65,836</u>
	<u>Average maturity</u>	<u>Amortized cost</u>	<u>Unrealized gains</u>	<u>Unrealized losses</u>	<u>Fair value</u>
<b>December 31, 2013</b>					
Cash		\$ 2,188	\$ —	\$ —	\$ 2,188
Money market funds		7,450	—	—	7,450
Cash and cash equivalents		<u>\$ 9,638</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 9,638</u>
U.S. Treasury obligations	301 days	\$ 500	\$ —	\$ —	\$ 500
Government agency securities	324 days	22,535	4	—	22,539
Investments		<u>\$ 23,035</u>	<u>\$ 4</u>	<u>\$ —</u>	<u>\$23,039</u>

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 2014 and 2013, 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 measures certain financial assets and liabilities at fair value on a recurring basis (principally cash equivalents, investments and the preferred stock warrant liability) that have been classified as Level 1, 2 or 3 within the fair value hierarchy as described below. Fair values determined by Level 1 inputs utilize quoted prices (unadjusted) in active markets for identical assets or liabilities that the Company has the ability to access. Fair values determined by Level 2 inputs utilize data points that are observable, such as quoted prices, interest rates



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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

and yield curves. Fair values determined by Level 3 inputs utilize unobservable data points for the asset or liability. The Company's investments in money market funds, U.S. treasury obligations and government agency securities have been classified as Level 1 because their fair values are based on quoted market prices. The preferred stock warrant liability was classified as Level 3 because certain inputs to the valuation of the warrant are based on unobservable inputs.

As of December 31, 2014 and December 31, 2013, the Company's financial assets and liabilities recognized at fair value consisted of the following:

	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Total</u>
<b>December 31, 2014</b>				
Money market funds, included in cash equivalents	\$11,904	\$ —	\$ —	\$11,904
Investments, available for sale:				
U.S. Treasury obligations	12,035	—	—	12,035
Government agency securities	53,801	—	—	53,801
Total	<u>\$77,740</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$77,740</u>
	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Total</u>
<b>December 31, 2013</b>				
Assets:				
Money market funds, included in cash equivalents	\$ 7,450	\$ —	\$ —	\$ 7,450
Investments, available for sale:				
U.S. Treasury obligations	500	—	—	500
Government agency securities	22,539	—	—	22,539
Total	<u>\$30,489</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$30,489</u>
Liabilities:				
Warrant to purchase redeemable securities	\$ —	\$ —	\$ 463	\$ 463

The fair value of the preferred stock 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 Company's outstanding warrant to purchase preferred stock 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. The assumptions used to value the warrant are more fully described in Note 12.

The carrying amount of financial instruments not carried at fair value, including the loan payable and leasehold improvement loan, approximate fair value. The carrying value of the Company's loan payable and leasehold improvement loan approximated fair value because the interest rate yields for the loans approximate current market yields. The disclosed fair values of the Company's loan payable and leasehold improvement loan are Level 3 liabilities within the fair value hierarchy.

#### 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.

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### CONCERT PHARMACEUTICALS, INC.

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#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

At December 31, 2014 and 2013, substantially all of the Company's cash was deposited in accounts at two highly rated 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 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, 2014.

#### 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 the Lexington, Massachusetts facility lease, which are recognized as a reduction to rent expense over the remaining lease term. Refer to Note 9 for additional details regarding the Company's operating lease.

#### 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

**CONCERT PHARMACEUTICALS, INC.**

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**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

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.

**CONCERT PHARMACEUTICALS, INC.**

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**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

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.

*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

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### CONCERT PHARMACEUTICALS, INC.

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#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

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.

Direct research and development expenses associated with the Company's programs include clinical trial site costs, 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 programs. Indirect costs of the Company's clinical program include salaries, 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 7 for additional information.

Prior to the Company's IPO, the estimated fair value of its common stock 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.

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### CONCERT PHARMACEUTICALS, INC.

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#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

##### 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 9, 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, 2014 and 2013, 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

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

##### Earnings (Loss) Per Share

Basic earnings (loss) per share is computed by dividing income (loss) allocable to common stockholders, computed as the sum of net income (loss) and accretion on the Company's redeemable convertible preferred stock, by the weighted average number of common shares outstanding. During periods of income where participating securities are outstanding, participating securities are allocated a proportional share of income determined by dividing total weighted-average participating securities by the sum of the total weighted-average common shares and participating securities (the "two-class method"). Prior to its automatic conversion into common stock upon the closing of the IPO, the Company's redeemable convertible preferred stock was entitled to participate in any dividends declared by the Company and was therefore considered to constitute participating securities. Participating securities have the effect of diluting both basic and diluted earnings per share during periods of income. During periods of loss, no loss is allocated to participating securities since they have no contractual obligation to share in the losses of the Company. Diluted earnings (loss) per share is computed after giving consideration to the dilutive effect of stock options and a warrant that are outstanding during the periods, except where such securities would be anti-dilutive.

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

In the first quarter of 2014, the Company issued an additional 6,649,690 shares of common stock in connection with its IPO and 9,919,821 shares of common stock in connection with the automatic conversion of its redeemable convertible preferred stock upon the closing of the IPO. The issuance of these shares resulted in a significant increase in the Company's weighted-average shares of common stock outstanding for the year ended December 31, 2014 when compared to the prior year periods and is expected to continue to impact the year-over-year comparability of the Company's earnings (loss) per share calculations until the first quarter of 2015.

The following common stock equivalents were excluded from the calculation of diluted net loss per share for the periods indicated because including them would have had an anti-dilutive effect (in thousands):

	Year ended December 31,		
	2014	2013	2012
Preferred stock	—	9,920	9,920
Warrant	71	71	71
Outstanding stock options	2,689	1,953	1,960
	<u>2,760</u>	<u>11,944</u>	<u>11,951</u>

#### Recent 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 the Company retrospectively beginning in the first quarter of fiscal 2017 with early adoption not permitted. The Company is currently assessing the impact of this ASU on its consolidated financial statements.

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. ASU 2014-15 will be effective for the Company's fiscal year 2016 and for interim periods beginning in the first quarter of fiscal 2017. The Company is still evaluating the impact of this ASU on its financial statement disclosures.

#### 3. Restricted Cash

At December 31, 2014 and 2013, \$0.4 million and \$0.7 million, respectively, 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.

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

##### 4. Property and Equipment

Property and equipment consists of the following at December 31, 2014 and 2013 (in thousands):

	Estimated useful life (in years)	December 31, 2014	December 31, 2013
Laboratory equipment	5	\$ 1,544	\$ 2,062
Computer, telephone and office equipment	3	175	143
Software	3	88	66
Leasehold improvements			
	Lesser of useful life or remaining lease term	6,392	5,848
		8,199	8,119
Less accumulated depreciation and amortization		(5,915)	(5,646)
		<u>\$ 2,284</u>	<u>\$ 2,473</u>

Depreciation and amortization expense was charged to operations in the amounts of \$1.1 million, \$1.3 million and \$1.5 million for the years ended December 31, 2014, 2013 and 2012, respectively.

##### 5. Accrued Expenses and Other Liabilities

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

	December 31, 2014	December 31, 2013
Accrued professional fees and other	\$ 916	\$ 569
Employee compensation and benefits	1,606	290
Research and development expenses	2,104	860
Deferred lease incentive, current portion	308	513
Deferred rent, current portion	68	243
	<u>\$ 5,002</u>	<u>\$ 2,475</u>

##### 6. 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. The Company classified the Convertible Preferred Stock outside of stockholders' equity (deficit) because the shares contained contingent redemption features that were not solely within the Company's control. 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.

Subsequent to the closing of the Company's IPO, the Company is authorized to issue up to 5,000,000 shares of preferred stock in one or more series and to fix the powers, designations, preferences and relative participating, option or other rights thereof, including dividend rights, conversion rights, voting rights, redemption terms, liquidation preferences and the number of shares constituting any series, without any further vote or action by the Company's stockholders. As of December 31, 2014, the Company had no shares of preferred stock issued or outstanding.



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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

Convertible Preferred Stock consisted of the following as of December 31, 2013 (in thousands):

	<u>Preferred shares authorized</u>	<u>Preferred shares issued and outstanding</u>	<u>Redemption value / liquidation preference</u>	<u>Carrying value</u>	<u>Common stock issuable upon conversion</u>
Series A	10,000	10,000	\$ 10,000	\$ 9,993	1,770
Series B	24,250	24,250	48,500	48,488	4,292
Series C	22,000	15,130	37,826	37,809	2,678
Series D	6,667	6,667	16,667	15,954	1,180
	<u>62,917</u>	<u>56,047</u>	<u>\$ 112,993</u>	<u>\$112,244</u>	<u>9,920</u>

## 7. Stock Compensation

### *Stock incentive plan*

The Company previously sponsored an Amended and Restated 2006 Stock Option and Grant Plan, or the 2006 Plan, which provided for the issuance of a total of 2,212,389 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.

In January 2014, in preparation for the Company's IPO, the 2006 Plan was replaced by the Company's 2014 Stock Incentive Plan, or the 2014 Plan. The 2014 Plan 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. Upon the closing of the Company's IPO on February 19, 2014, 2,249,911 shares of common stock were reserved for issuance under the 2014 Plan. The number of shares reserved under the 2014 Plan is subject to further increase by the number of shares of common stock subject to outstanding awards under the 2006 Plan that expire, terminate or are otherwise surrendered, cancelled, forfeited or repurchased. 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. The annual increase will be added on the first day of each year beginning in 2015 and each subsequent anniversary until 2024, equal to the lowest of 2,000,000 shares of common stock, 4.0% of the number of shares of common stock outstanding on January 1 of each such fiscal year and an amount determined by the board of directors. Effective January 1, 2015, 729,363 shares were added to the 2014 Plan for future issuance pursuant to this evergreen provision.

The following table is a roll-forward of shares available for future grant under the 2014 Plan:

	<u>Shares Available for Grant</u>
Shares reserved for future grant at February 19, 2014	2,249,911
Add: stock options and restricted stock awards forfeited or expired under plans	68,186
Less: stock options and awards granted from February 19, 2014 to December 31, 2014	<u>(1,182,143)</u>
Shares reserved for future grant at December 31, 2014	<u>1,135,954</u>

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

##### Stock Options

The weighted-average fair value of options granted during the years ended December 31, 2014, 2013 and 2012 based on fair values estimated as of the applicable grant dates using the Black-Scholes-Merton option pricing model, was \$6.69, \$13.77 and \$6.53 per option share, respectively.

For the years ended December 31, 2014, 2013 and 2012, the fair values of options granted were estimated using the Black-Scholes-Merton option pricing model using the following weighted-average assumptions:

	Year ended December 31,		
	2014	2013	2012
Expected volatility	80.94%	70.10%	72.80%
Expected term	6.0 years	6.0 years	6.0 years
Risk-free interest rate	1.90%	1.69%	0.95%
Expected dividend yield	0.00%	0.00%	0.00%

*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, 2014, 2013 and 2012, 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, 2014, 2013 and 2012, the Company estimated a forfeiture rate of 5%.

During the years ended December 31, 2014, 2013 and 2012, the total intrinsic value of stock options exercised was \$2.4 million, \$0.1 million and \$0, respectively. Cash received from option exercises for the years ended December 31, 2014, 2013 and 2012 was \$1.0 million, \$32 thousand and \$0, respectively.

The total grant date fair value of stock options that vested during the years ended December 31, 2014, 2013 and 2012 was \$0.6 million, \$0.9 million and \$0.9 million, respectively.

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

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 (In years)	Aggregate Intrinsic Value (In thousands)
Outstanding at December 31, 2013	1,952,578	\$ 3.14		
Granted	1,182,143	\$ 9.68		
Exercised	(366,258)	\$ 2.76		
Forfeited or expired	(79,526)	\$ 4.08		
Outstanding at December 31, 2014	<u>2,688,937</u>	\$ 6.04	6.79	19,699
Exercisable at December 31, 2014	<u>1,425,925</u>	\$ 3.27	4.59	14,329
Vested and expected to vest at December 31, 2014 (1)	<u>2,594,803</u>	\$ 5.92	6.70	19,315

(1) This represents the number of vested options as of December 31, 2014, plus the number of unvested options expected to vest as of December 31, 2014, based on the unvested options at December 31, 2014, adjusted for the estimated forfeiture rate of 5%.

The aggregate intrinsic values in the preceding table represent the total pre-tax intrinsic value (the difference between the Company's common stock price on the last day of the reporting period and the exercise price, multiplied by the number of in-the-money stock options) that would have been received by the stock option holders had all stock option holders exercised their stock options at the end of the reporting period. The amount of aggregate intrinsic value will change based on the fair value of the Company's common stock.

#### Stock-based compensation expense

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

	For the Year Ended December 31,		
	2014	2013	2012
Research and development	\$ 802	\$ 583	\$ 564
General and administrative	891	420	304
Total stock-based compensation expense	<u>\$ 1,693</u>	<u>\$ 1,003</u>	<u>\$ 868</u>

As of December 31, 2014 there was \$7.2 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 3.1 years.

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

##### Reserved Shares

The Company had reserved the following shares of common stock as of December 31, 2014 for the potential exercise of outstanding warrants and stock options:

	December 31,
	<u>2014</u>
Warrants	70,796
Common stock options	3,824,891
Shares reserved for issuance at December 31, 2014	<u>3,895,687</u>

##### 8. Income Taxes

During fiscal years 2014, 2013 and 2012, the Company did not record a benefit for income taxes related to its operating losses. The Company has provided a full valuation allowance against its net deferred tax assets, as the Company believes that it is more likely than not that the deferred tax assets will not be realized.

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

	Year ended December 31,		
	<u>2014</u>	<u>2013</u>	<u>2012</u>
Federal statutory income tax rate	34.0 %	34.0%	34.0%
State income taxes	5.3	5.3	5.3
Change in valuation allowance	(41.0)	(43.3)	(34.9)
Research and development credits	4.5	31.7	1.2
Permanent items	(0.7)	(5.9)	(1.8)
Expiring state net operating loss carryforward	(2.1)	(21.8)	(3.8)
Effective income tax rate	<u>0.0 %</u>	<u>0.0%</u>	<u>0.0%</u>

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

	December 31,	
	<u>2014</u>	<u>2013</u>
Net operating loss carryforwards	\$ 44,186	\$ 38,585
Deferred revenue	6,215	1,081
Research and development credit carryforwards	7,728	6,277
Other	1,863	1,043
	<u>59,992</u>	<u>46,986</u>
Valuation allowance	(59,992)	(46,986)
Net deferred tax assets	<u>\$ —</u>	<u>\$ —</u>

At December 31, 2014, the Company had federal net operating loss carryforwards of \$119.5 million and state net operating loss carryforwards of \$67.6 million available to reduce future taxable income, which expire at various dates beginning in 2015 through 2035. The Company also had federal and state research and development tax credit carryforwards of \$6.0 million and \$2.6 million, respectively, available to reduce future tax liabilities, which expire at various dates through 2035.

**CONCERT PHARMACEUTICALS, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

Realization of the future tax benefits is dependent on many factors, including the Company's ability to generate taxable income within the net operating loss 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, 2014 and 2013.

Under the provisions of the Internal Revenue Code Section 382, the net operating loss and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service and state tax authorities. Net operating loss and tax credit carryforwards may become 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, respectively, as well as similar state provisions. This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the value of the company immediately prior to the ownership change. Subsequent ownership changes may further affect the limitation in future years. The Company has completed several financings since its inception which may have resulted in a change in control as defined by Sections 382 and 383 of the Internal Revenue Code, or could result in a change in control in the future.

At December 31, 2014, 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, 2014, 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 2011 through 2013. 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.

**9. Commitments**

In February 2008, the Company entered into a seven-year, non-cancelable operating lease for approximately 45,000 square feet of office and laboratory space, or the 2008 Lease Agreement, in Lexington, Massachusetts, which serves as the Company's headquarters.

The 2008 Lease Agreement included certain lease incentives in the form of two tenant improvement allowances. The first tenant improvement allowance of \$3.7 million was for general improvements to the facility's office space and HVAC systems. The Company capitalized the improvements made with the first tenant improvement allowance into fixed assets and established a liability in the accompanying balance sheet under the caption "deferred lease incentive".

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

The second tenant improvement allowance of \$2.3 million was for improvements to be made to build laboratory space to the Company's specifications. The second tenant improvement allowance was similar to the first, except that the Company was required to repay the reimbursements to the landlord monthly over the lease term, plus interest at a 10% annual rate. The Company capitalized the improvements made with the second tenant improvement allowance into fixed assets and established a liability, exclusive of interest, in the accompanying balance sheet under the caption "leasehold improvement loan".

In August 2014, the Company entered into an amendment of its 2008 Lease Agreement, or the Amendment of Lease, pursuant to which the Company will lease through September 30, 2018 the approximately 45,000 square feet of office and laboratory space that was covered by the 2008 Lease Agreement as well as an additional 5,000 square feet of office space. A tenant improvement allowance of \$0.4 million was provided by the landlord under the Amendment of Lease for general improvements. The Amendment of Lease also provides for the waiver of the remaining monthly payments due under the Company's outstanding leasehold improvement loan, totaling \$0.3 million as of December 31, 2014, and a reduction in the letter of credit the Company delivered under the 2008 Lease Agreement from \$0.7 million to \$0.4 million. Waiver of the leasehold improvement loan will occur on a monthly basis from October 1, 2014 through September 30, 2015 and was considered to represent a lease incentive. Accordingly, the remaining principal balance of the leasehold improvement loan as of December 31, 2014 has been classified as a component of deferred lease incentive in the accompanying balance sheet and will be recognized over the remainder of the extended lease term. The Company capitalized the improvements made with the tenant improvement allowance provided in the Amendment of Lease and established a liability in the accompanying balance sheet under the caption "deferred lease incentive."

The Company is amortizing all leasehold improvement assets and deferred incentives over the remaining lease term, as amended.

The Amendment of Lease provides for escalating rent payments over the lease term. The Company is recognizing rental expense under the Amendment of Lease on a straight-line basis after considering the escalating rent payments and the remaining deferred rent under the 2008 Lease Agreement.

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

	<u>Base rent obligations</u>
At December 31, 2014	
2015	\$ 1,540
2016	1,522
2017	1,573
2018	1,208
Total minimum lease payments	<u>\$ 5,843</u>

Rent expense for the years ended December 31, 2014, 2013 and 2012 was \$1.0 million, \$0.7 million and \$0.7 million, respectively.

#### Employment agreements

Five of the Company's employees are covered by employment agreements, covering salary, certain benefits and incentive compensation. Under these agreements, the executives could be entitled to severance pay up to 12 months of base salary, paid COBRA insurance coverage for 12 months and acceleration of stock option

**CONCERT PHARMACEUTICALS, INC.**

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**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

vesting (assuming for such acceleration a termination without cause or on death or disability or resignation for good reason within one year after a change in control). During 2013, the Company accrued \$0.3 million in severance and benefit obligations in connection with the departure of its Chief Medical Officer, with the associated costs allocated to research and development expenses on the statement of operations and comprehensive loss. Approximately \$69 thousand of cash payments related to these obligations were made during 2013, resulting in a total recorded liability of \$0.3 million related to this obligation as of December 31, 2013, which was subsequently paid in 2014.

**10. 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 collaboration is initially focused on one program, but has the potential to encompass up to four programs.

For the initial program, the Company granted Celgene an exclusive worldwide license to develop, manufacture and commercialize deuterated analogs of a selected non-deuterated compound 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 and Celgene have agreed on the non-deuterated compounds for each of the two additional license programs. For the option program, Celgene may select the non-deuterated compound at a later time, which, unless otherwise agreed by the Company, will be limited to a compound for which Celgene possesses exclusive rights. With respect to the two additional license programs, the Company granted Celgene an upfront exclusive worldwide license to develop, manufacture and commercialize deuterated products that contain deuterated analogs of the agreed non-deuterated compounds. Celgene is restricted from utilizing their research, development and commercialization rights under each of these upfront licenses, unless, within seven years after the effective date of the agreement, Celgene pays the Company a license exercise fee. If Celgene does not elect to pay the license exercise fee during the seven year period, the license will expire. With respect to the option program, once a compound is selected, Celgene may exercise its option by paying the Company an option exercise fee within seven years of the effective date of the agreement, and upon Celgene's exercise of the option the Company will grant to Celgene an exclusive worldwide license to develop, manufacture and commercialize deuterated products that contain deuterated analogs of the selected non-deuterated compound.

The Company is responsible for conducting and funding research and early development activities for the initial program at its own expense pursuant to mutually agreed upon development plans. This includes the completion of single and multiple ascending dose Phase 1 clinical trials and any mutually agreed upon additional Phase 1 clinical trials, as set forth in the development plan and approved by the joint steering committee for the collaboration.

Under the terms of the agreement, the Company received a non-refundable upfront payment of \$35.0 million. In addition, the Company is eligible to earn up to \$23.0 million in development milestone payments, including \$8.0 million related to the completion of a Phase 1 clinical trial, 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 initial program. The next milestone payment the Company may be entitled to receive under the initial program is \$8.0 million related to the completion of Phase 1 clinical trials of CTP-730. 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

**CONCERT PHARMACEUTICALS, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

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 sales-based 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 sales-based 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 term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the latest of expiration of specified patent coverage, expiration of regulatory exclusivity or 10 years following commercial launch. 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 a selected compound related to the initial program, or the License Deliverable, (ii) obligations to perform research and development services associated with the initial program, or the R&D Services Deliverable, (iii) obligation to supply preclinical and clinical trial material related to the initial program, or the Supply Deliverable, (iv) participation on the JSC program for the term of the initial 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 as follows: (i) \$17.0 million to the License Deliverable; (ii) \$8.7 million to the R&D Services Deliverable for the initial program; (iii) \$3.2 million to the Supply Deliverable for the initial program; (iv) \$0.1 million to the JSC Deliverable for the initial program; (v) \$3.0 million to the First Discount Deliverable for the first additional program; and (vi) \$3.0 million to the Second Discount Deliverable for the second additional program.

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, or 39 months. The amount allocated to the JSC Deliverable is recognized ratably over the expected period of performance, or 39 months. Amounts allocated to the First Discount Deliverable and the Second Discount Deliverable are deferred and will be recognized at the earlier of when the associated license rights are exercised and licenses are delivered or upon lapsing of the underlying right, if the respective right expires unexercised. The Company reassesses the estimated periods of performance for each unit of accounting at the end of each reporting period.

During the years ended December 31, 2014 and 2013, the Company recognized revenue of \$1.8 million and \$0.7 million for the R&D Services Deliverable and \$1.9 million and \$0.6 million for the Supply Deliverable, respectively. Additionally, during the years ended December 31, 2014 and 2013, the Company recognized



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### CONCERT PHARMACEUTICALS, INC.

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#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

revenue of \$32 thousand and \$24 thousand, respectively, related to the JSC Deliverable. The revenue was classified as license and research and development revenue in the accompanying consolidated statement of operations and comprehensive loss.

As of December 31, 2014, there was \$12.9 million of deferred revenue related to the Company's collaboration with Celgene, \$5.8 million of which was classified as current and \$7.1 million of which was classified as noncurrent, 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 deuterated sodium oxybate, or D-SXB. The Company 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 us to develop, manufacture and commercialize D-SXB products including, but not limited to, JZP-386.

The Company, together with Jazz Pharmaceuticals, is conducting certain development activities for a Phase 1 clinical trial with respect to JZP-386 pursuant to an agreed upon development plan. The Company is responsible under the development plan for conducting a Phase 1 clinical trial with respect to JZP-386. Thereafter, the Company's obligations to conduct further development activities are subject to mutual agreement. Jazz Pharmaceuticals has assumed all manufacturing responsibilities. Pursuant to the agreement, the Company's costs for activities under the development plan, including pass-through costs and the costs of the Company's employees' time at a rate per full-time equivalent year of its employees' time, which the Company and Jazz Pharmaceuticals mutually agreed to, are reimbursed by Jazz Pharmaceuticals, except for the costs of an additional Phase 1 clinical trial that was initiated in the first quarter of 2015, which will be shared between Jazz Pharmaceuticals and the Company. This reimbursement is subject to limitations specified in the agreement, including adherence within a particular percentage to the development budget. Under the agreement, Jazz Pharmaceuticals is subject to specified diligence obligations regarding the development and commercialization of licensed products.

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 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 the successful completion of a Phase 1 clinical trial or clinical advancement of JZP-386, a deuterated analog of sodium oxybate.

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 a country-by-country and licensed product-by-licensed product basis, on worldwide net product sales of licensed products. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the later of the expiration of specified patent coverage or 10 years following commercial launch. 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.

**CONCERT PHARMACEUTICALS, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

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, which are each estimated to be 46 months.

For the years ended December 31, 2014 and 2013, the Company recognized revenue of \$2.6 million and \$1.1 million related to the performance of development support services, respectively. For the year ended December 31, 2013 the Company recognized revenue of \$3.7 million upon delivery of the License Deliverable. Additionally, for the years ended December 31, 2014 and 2013, the Company recognized revenue of \$56 thousand and \$61 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 deuterated dextromethorphan containing products. 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. Avanir is initially focused on developing AVP-786, which is a combination of a deuterated dextromethorphan analog and an ultra-low dose of quinidine, for the treatment of neurologic and psychiatric disorders.

Under the agreement, the Company received a non-refundable upfront payment of \$2.0 million, a milestone payment of \$2.0 million in 2013 and a milestone payment of \$2.0 million in 2014. The Company is also eligible to earn, with respect to licensed products comprising a combination of deuterated dextromethorphan and quinidine, up to \$2.0 million in development milestone payments related to initiation of dosing in a Phase 3 clinical trial for AVP-786, up to \$37.0 million in regulatory and commercial launch milestone payments and up to \$125.0 million in sales-based milestone payments. The next milestone that the Company may be entitled to earn is \$2.0 million related to the initiation of dosing in a Phase 3 clinical trial for 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 deuterated dextromethorphan only 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 worldwide net sales of licensed products. The royalty term for each licensed product in each country is the period commencing with first commercial sale of the applicable licensed product in the applicable country and ending on the later of expiration of specified patent coverage or 10 years following commercial launch. 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.

The Company determined that the deliverables under the agreement were the exclusive, royalty-bearing sub-licensable license to deuterated dextromethorphan delivered at the inception of the arrangement as well as participation on a joint steering committee through a first IND filing. The Company allocated arrangement consideration of \$2.0 million to the license and an insignificant amount to the Company's participation on the joint steering committee. Accordingly, the Company recognized the \$2.0 million non-refundable upfront fee as revenue upon delivery of the deuterated dextromethorphan license in March 2012.

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. Since

**CONCERT PHARMACEUTICALS, INC.**

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**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)**

June 2012, Avanir has elected to conduct all research and development activities, including manufacturing activities; however, the Company has continued to receive intellectual property cost reimbursements. The Company recognized \$0.2 million for the year ended December 31, 2014 for intellectual property cost reimbursements, the cost of which was recorded within general and administrative expense.

During the year ended December 31, 2013, the Company recognized as revenue a \$2.0 million milestone payment received from Avanir based on positive data from Avanir's Phase 1 clinical trial of AVP-786. The Company also recognized \$0.2 million for the year ended December 31, 2013 for intellectual property cost reimbursements.

During the year ended December 31, 2012, the Company recognized as revenue a \$2.0 million non-refundable upfront license fee upon delivery of the deuterated dextromethorphan license and \$0.2 million for intellectual property cost reimbursements.

*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 \$2.75 million payment to the Company. The rights to the product candidates developed under the agreement have reverted to the Company and it is free to pursue them without further obligation to GSK other than to repay GSK an amount of up to \$2.75 million if the Company commercializes CTP-499 or if, prior to a specified date in 2018, the Company re-licenses or transfers rights to CTP-499 to a third party. The \$2.75 million payment was classified as deferred revenue and will not be recognized as revenue until all repayment obligations lapse.

**11. Sponsored Research Agreement**

In February 2012, the Company entered into a sponsored research agreement with Fast Forward LLC, or Fast Forward, the National Multiple Sclerosis Society's subsidiary devoted to research and drug development. Under the research agreement, Fast Forward provided \$0.8 million of funding for the preclinical advancement of CTP-354, a deuterated subtype-selective GABA<sub>A</sub> modulator developed by Concert with the therapeutic potential of treating spasticity. Concert received the funding as it met certain preclinical milestones.

In certain circumstances, the Company is obligated to make milestone payments to Fast Forward not in excess of a low-single digit multiple of the funding amount. As of December 31, 2014 and 2013, it was not probable any milestone payments would be owed to Fast Forward.

The Company did not receive any payments from Fast Forward during the year ended December 31, 2014. During the years ended December 31, 2013 and 2012, the Company received payments totaling \$45 thousand and \$0.7 million, respectively, from Fast Forward, which were recognized as revenue within license and research and development revenue in the accompanying statement of operations and comprehensive loss. The revenue recognized is commensurate with the services performed in 2013 and 2012, and such payments are non-refundable as the Company has incurred costs in excess of the amounts funded.

**12. 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

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

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. The Company incurred \$0.2 million in loan issuance costs paid directly to the lenders, which have been offset against the loan proceeds as a loan discount.

Each advance made under the Loan and Security Agreement bears interest at a variable rate of the greater of 8.5% and an amount equal to 8.5% plus the prime rate of interest minus 5.25%, provided however, that the per annum interest rate shall not exceed 11%. Through December 31, 2014, each of the December 2011 Advance and the March 2012 Advance had an interest rate of 8.5%. Interest-only payments were due monthly on the first day of each month beginning the month after the date of the respective advance until April 30, 2013. Thereafter the aggregate principal balance outstanding became payable in 30 equal monthly installments of principal and interest beginning May 1, 2013 and continuing through the maturity date of October 1, 2015.

Additionally, the advances are to be repaid in full immediately upon an event of default, as defined. The Loan and Security Agreement defines events of default, including the occurrence of an event that results in a material adverse effect upon the Company's business operations, properties, assets or condition (financial or otherwise), its ability to perform its obligations under and in accordance with the terms of the new loan agreement, or upon the ability of the lenders to enforce any of their rights or remedies with respect to such obligations, or upon the collateral under the Loan and Security Agreement or upon the liens of the lenders on such collateral or upon the priority of such liens. The Company does not believe that any events have occurred that could reasonably be deemed to have a material adverse effect. Substantially all assets of the Company are pledged as collateral, with the exception of intellectual property, which is the subject of a negative pledge under the Loan and Security Agreement. The lenders' security interest in the collateral is a first priority security interest. The Company does not have any financial covenants under the Loan and Security Agreement.

As of December 31, 2014, the future minimum payments due under the Loan and Security Agreement are as follows (in thousands):

	<u>Year</u>	<u>Minimum Payments</u>
	2015	7,462
Less amounts representing interest		(287)
Present value of minimum payments		7,175
Less discount		(74)
Loan payable and unamortized discount		<u>\$ 7,101</u>

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.

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

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. The following table sets forth a summary of changes in the fair value of the Warrant during each period presented (in thousands):

	Year ended December 31,		
	2014	2013	2012
Beginning balance	\$ 463	\$ 459	\$ 168
Change in fair value	117	4	291
Reclassification to additional paid-in capital in connection with IPO	(580)	—	—
Ending balance	<u>\$ —</u>	<u>\$ 463</u>	<u>\$ 459</u>

The Warrant expires on the earlier of: (i) ten years from the effective date of the Loan and Security Agreement or (ii) five years after the closing of an IPO.

The Company measured the fair value of the Warrant as of December 31, 2012 and December 31, 2013 using a hybrid method that is consistent with the manner in which the Company estimated the fair value of its common stock on those dates. Using the hybrid method, the Company used the Black-Scholes-Merton option pricing method to value the Warrant based on the results of the initial public offering scenarios and the option pricing method to value the Warrant based on the results of the other assumed scenarios (sale or liquidation). The results of those valuations were then weighted consistent with the weightings used in the Company's common stock valuation to determine the fair value of the Warrant. The significant assumptions used in estimating the fair value of the Warrant include the volatility of the stock underlying the warrant, risk-free interest rate, estimated fair value of the preferred stock underlying the warrant, and the estimated life of the warrant.

As of February 19, 2014, upon completion of the IPO, the Warrant converted to a warrant to purchase common stock and the Company remeasured the Warrant using the Black-Scholes-Merton option pricing method based upon the closing price of the Company's common stock on February 19, 2014.

Where the fair value of the Warrant was estimated using the Black-Scholes-Merton option pricing model, the Company used the following weighted-average assumptions:

	Year ended December 31,		
	2014	2013	2012
Expected volatility	70.0%	70.0%	70.0%
Expected term	5.0 years	5.3 years	7.9 years
Risk-free interest rate	1.53%	1.75%	0.95%
Expected dividend yield	0.0 %	0.0%	0.0%

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### CONCERT PHARMACEUTICALS, INC.

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (continued)

##### Expected volatility

The Company estimated the expected volatility based on actual historical volatility of the stock price of similar companies with publicly-traded equity securities. The Company calculated the historical volatility of the selected companies by using daily closing prices over a period of the expected term of the Warrant. The companies were selected based on their enterprise value, risk profiles, position within the industry, and with historical share price information sufficient to meet the expected term of the associated award.

##### Expected term

The Company based the expected term on the actual remaining contractual term as of each respective measurement date.

##### Risk-free interest rate

The Company estimated the risk-free interest rate in reference to the yield on U.S. Treasury securities with a maturity date commensurate with the expected term of the Warrant.

##### Expected dividend yield

The Company estimated the expected dividend yield based on consideration of its historical dividend experience and future dividend expectations. The Company has not historically declared or paid dividends to stockholders. Moreover, it does not intend to pay dividends in the future, but instead expects to retain any earnings to invest in the continued growth of the business. Accordingly, the Company assumed an expected dividend yield of 0.0%.

#### 13. 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 \$0.2 million, \$0.2 million and \$0.2 million for the years ended December 31, 2014, 2013 and 2012, respectively.

#### 14. Quarterly Financial Information (unaudited)

	Three Months Ended			
	March 31, 2014	June 30, 2014 (in thousands, except per share data) (unaudited)	September 30, 2014	December 31, 2014
Revenue	\$ 1,613	\$ 1,235	\$ 4,418	\$ 1,310
Operating expenses	8,132	8,961	12,026	10,055
Loss from operations	(6,519)	(7,726)	(7,608)	(8,745)
Other expense, net	(431)	(264)	(224)	(182)
Net loss	<u>\$ (6,950)</u>	<u>\$ (7,990)</u>	<u>\$ (7,832)</u>	<u>\$ (8,927)</u>
Net loss per share—basic and diluted	\$ (0.76)	\$ (0.45)	\$ (0.43)	\$ (0.49)

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	Three Months Ended			
	March 31, 2013	June 30, 2013 (in thousands, except per share data) (unaudited)	September 30, 2013	December 31, 2013
Revenue	\$ 5,873	\$17,441	\$ 681	\$ 1,413
Operating expenses	7,003	8,026	7,797	6,992
(Loss) income from operations	(1,130)	9,415	(7,116)	(5,579)
Other expense, net	(649)	(650)	(11)	(336)
Net (loss) income	\$ (1,779)	\$ 8,765	\$ (7,127)	\$ (5,915)
Net loss per share—basic and diluted	\$ (1.46)	\$ 0.00	\$ (5.59)	\$ (4.64)

### 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, 2014, 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;

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- 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, 2014 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, 2014.

### 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, 2014 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

### ITEM 9B. Other Information

None.



**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, 2015.

<u>Name</u>	<u>Age</u>	<u>Position(s)</u>
<i>Executive Officers</i>		
Roger D. Tung, Ph.D.	55	President and Chief Executive Officer, Director
Nancy Stuart	56	Chief Operating Officer
Ryan Daws	41	Chief Financial Officer
Ian Robert Silverman, J.D., Ph.D.	62	Senior Vice President and General Counsel
James Cassella, Ph.D.	60	Senior Vice President and Chief Development Officer
<i>Non-Employee Directors</i>		
Richard H. Aldrich <sup>(2)(3)</sup>	60	Director, Chairman of the Board of Directors
Thomas G. Auchincloss, Jr. <sup>(1)</sup>	53	Director
Ronald W. Barrett, Ph.D. <sup>(2)</sup>	59	Director
John G. Freund, M.D. <sup>(1)</sup>	61	Director
Peter Barton Hutt <sup>(3)</sup>	80	Director
Wilfred E. Jaeger, M.D. <sup>(1)(2)</sup>	59	Director
Helmut M. Schühlsler, Ph.D.	55	Director
Wendell Wierenga, Ph.D. <sup>(3)</sup>	67	Director

(1) Member of audit committee.

(2) Member of compensation committee.

(3) Member of the nominating and corporate governance committee.

**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, 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 28 year career in the global pharmaceutical and biotechnology industries, including his roles at Vertex, provide a critical contribution to our board of directors.

*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.

*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

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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 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.

*James V. Cassella, Ph.D.* 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 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.

### 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 Founder and has been Partner of Longwood Fund, a venture capital firm, since December 2010. Mr. Aldrich founded RA Capital Management LLC, a hedge fund, in 2004 and served as a Managing Member from 2004 to 2008 and as a Co-Founding Member from 2008 until 2011. Mr. Aldrich has co-founded several biotechnology companies including Sirtris Pharmaceuticals, Inc., which was acquired by GlaxoSmithKline in 2008, and Alnara Pharmaceuticals, Inc., which was acquired by Eli Lilly in 2011. He has also held management positions at Vertex, where he was a co-founding employee, and Biogen Corporation (now Biogen Idec Inc., a biotechnology company). Mr. Aldrich co-founded and serves on the board of directors of Verastem, Inc., a public biopharmaceutical company and also serves on the boards of directors of OvaScience, Inc., a public life sciences company of which he serves as chairman of the board, and PTC Therapeutics, 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 allows 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 August 2007 through September 2013, Mr. Auchincloss was self-employed in private investing. 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. He also serves as an advisor to Capital Formation Group Inc., a family investment firm and Acelium, a cyber-security

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company. 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, makes 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 is a founder of XenoPort, Inc., a public biopharmaceutical company, and has served as its Chief Executive Officer since 2001, its Chief Scientific Officer from 1999 to 2001 and as a member of its board of directors since 1999. Prior to XenoPort he held various positions at Affymax Research Institute, a drug discovery company now owned by GlaxoSmithKline plc, and Abbott Laboratories, a healthcare company. 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 publically traded biopharmaceutical company, makes him a key contributor to our board of directors.

*John G. Freund, M.D.* has served as a member of our board of directors since December 2013. Dr. Freund co-founded Skyline Ventures in 1997 and has served as a partner at Skyline since its founding. Prior to joining Skyline, Dr. Freund served as managing director in the private equity group of Chancellor Capital Management, a private capital investment firm. In 1995, he co-founded Intuitive Surgical, a medical device company, and served on its board of directors until 2000. From 1988 to 1994, Dr. Freund served in various positions at Acuson Corporation, a maker of ultrasound equipment that is now part of Siemens, most recently as Executive Vice President. Prior to joining Acuson, Dr. Freund worked at Morgan Stanley Venture Partners from 1987 to 1988. From 1982 to 1988, Dr. Freund was a general partner at Morgan Stanley & Co., an investment banking company, where he co-founded the Healthcare Group in the Corporate Finance Department in 1983. He has served on the board of directors of XenoPort, Inc., a publicly traded biopharmaceutical company, since 1999, Tetrphase Pharmaceuticals, Inc., a publicly traded biopharmaceutical company, since 2012, and Proteon Therapeutics Inc., a publicly traded biotechnology company, since 2014. Dr. Freund also serves on the board of directors of a number of private companies. He also previously served on the board of directors of Map Pharmaceuticals, a biopharmaceutical company, Hansen Medical, a medical device company, LJL Biosystems a life sciences instrumentation company, and Mako Surgical Corp., a medical device company. Dr. Freund is a member of the Advisory Board for the Harvard Business School Healthcare Initiative, and is a member of the Therapeutics Advisory Council of Harvard Medical School. Dr. Freund received a B.A. in history from Harvard College, an M.D. from Harvard Medical School and an M.B.A. from Harvard Business School. We believe that Dr. Freund's extensive finance and investment experience, his experience as an executive and his service on the board of directors of numerous public and privately held companies allows him to be 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., BIND Therapeutics, Inc., DBV Technologies SA, 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 Celera Genomics, a public biotechnology company that was acquired by Quest Diagnostics, Inc. in 2011 and Momenta Pharmaceuticals, Inc., a 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 allows 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, as well as numerous

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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. In addition to representing one of our principal stockholders, we believe that that Dr. Jaeger's financial and medical knowledge and experience allows him to be a key contributor to our board of directors.

*Helmut M. Schühsler, Ph.D.* has served as a member of our board of directors since September 2011. Dr. Schühsler has worked for TVM Capital, a group of life science venture capital and healthcare private equity firms, since 1990 and currently serves as its Chairman and Managing Partner. During 2007 and 2008, Dr. Schühsler also served as Chairman of the European Private Equity and Venture Capital Association. Dr. Schühsler currently serves as a member of the board of Enanta Pharmaceuticals, Inc., a public pharmaceutical company, several other healthcare growth companies and Max Planck Innovation, the technology transfer organization of the German Max Planck Society. For several years he was a member of the Selection Committee for the Technology Pioneers program. Prior to joining TVM Capital, Dr. Schühsler worked for Horizonte Venture Management, a venture capital firm, and was an assistant professor for corporate finance at the Institute for Advanced Studies in Vienna. Dr. Schühsler received a Ph.D. in the Social and Economic Sciences from the University of Economics in Vienna. In addition to representing one of our principal stockholders, we believe that Dr. Schühsler's business and financial experience as a director and investor in several companies in our industry allows 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 worked 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., 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 Anacor Pharmaceuticals, Inc., Apricus Biosciences, Inc., Cytokinetics, Incorporated, Ocera Therapeutics, Inc. and Xenoport, 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 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 allows him to be a key contributor to our board of directors.

## AUDIT COMMITTEE

Our board of directors has established an audit committee, which operates under a charter that has been approved by our board of directors. The members of our audit committee are Thomas G. Auchincloss, Jr., John G. Freund and Wilfred E. Jaeger. Mr. Auchincloss is the chair of the audit committee. Our board of directors has determined that each of these directors is independent within the meaning of Rule 10A-3 under the Securities Exchange Act of 1934, or the Exchange Act. In addition, 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 Securities and Exchange Commission, or SEC, regulations and the NASDAQ Listing Rules. In making this determination with respect to each of these directors, our board has considered the formal education and nature and scope of his

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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. Our audit committee's responsibilities include:

- appointing, approving the compensation of, and assessing the independence of the our 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 our 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 our independent registered public accounting firm and procedures for the receipt and retention of accounting related complaints and concerns;
- meeting independently with our internal auditing staff, our 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.

All audit services to be provided to us and all non-audit services, other than de minimis non-audit services, to be provided to us by our independent registered public accounting firm must be approved in advance by our audit committee.

### **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. A copy of the code is posted on the Corporate Governance section of our website, which is located at [www.concertpharma.com](http://www.concertpharma.com). If we make any substantive amendments to, or grant any waivers from, the code of business conduct and ethics for any officer or director, we will disclose the nature of such amendment or waiver on our website or in a current report on Form 8-K.

### **SECTION 16(A) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE**

Section 16(a) of the Exchange Act requires our directors and certain officers and holders of more than 10% of our common stock to file with the SEC initial reports of ownership of our common stock and other equity securities on a Form 3 and reports of changes in such ownership on a Form 4 or Form 5. These Section 16 reporting persons are required by SEC regulations to furnish us with copies of all Section 16(a) forms they file. Based solely on a review of the copies of such forms received by us, and written representations from certain reporting persons, we believe that during 2014, our directors, officers and 10% stockholders complied with all Section 16(a) filing requirements applicable to them with respect to our common stock during that fiscal year.

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### Item 11. Executive Compensation

This section discusses the material elements of our executive compensation policies for our “named executive officers” and the most important factors relevant to an analysis of these policies. It provides qualitative information regarding the manner and context in which compensation is awarded to and earned by our executive officers named in the “Summary compensation table” below, or our “named executive officers,” and is intended to place in perspective the data presented in the following tables and the corresponding narrative.

#### SUMMARY COMPENSATION TABLE

The following table sets forth information regarding compensation earned in 2014 and 2013 by our President and Chief Executive Officer and our next two highest paid executive officers during 2014. We refer to these individuals as our named executive officers.

Name	Year	Salary (\$)	Bonus (\$)	Option awards \$(1)	Non-equity incentive plan	All other compensation	Total (\$)
					compensation (\$)	(\$)	
Roger D. Tung, Ph.D.	2014	409,565	—	1,210,956	189,095 <sup>(2)</sup>	9,606	1,819,222
<i>President and Chief Executive Officer</i>	2013	373,171	—	—	212,211 <sup>(3)</sup>	8,178	593,560
Nancy Stuart	2014	329,741	—	595,650	106,514 <sup>(2)</sup>	9,606	1,041,511
<i>Chief Operating Officer</i>	2013	300,054	—	—	127,901 <sup>(3)</sup>	8,178	436,133
Ryan Daws	2014	282,358	97,000 <sup>(4)</sup>	1,389,273	88,647 <sup>(2)</sup>	47,224 <sup>(5)</sup>	1,904,502
<i>Chief Financial Officer</i>							

- (1) The amounts included in the “Option awards” column reflect the aggregate grant date fair value of awards during each year calculated in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Note 7 to the consolidated financial statements included in this annual report on Form 10-K.
- (2) Consists of a cash bonus paid under our 2014 executive bonus program that was earned as of the end of 2014. See the “Narrative disclosure to summary compensation table” described below for a description of this program.
- (3) Consists of a cash bonus paid under our 2013 executive bonus program that was earned as of the end of 2013 and a cash bonus under our 2012 executive bonus program that became payable during 2013 as the result of the satisfaction of a contingency during 2013.
- (4) Amount shown represents a sign-on bonus paid in connection with Mr. Daws’ commencement of employment with us in January 2014.
- (5) Amount includes \$29,417 paid to Mr. Daws in 2014 in connection with relocation and temporary living expense reimbursements.

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### Narrative disclosure to summary compensation table

*Base salary.* In 2014, we paid annual base salaries to Dr. Tung, Ms. Stuart and Mr. Daws in the amounts of \$409,565, \$329,741 and \$282,358, 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.* The compensation committee of our board of directors may, in its discretion, award bonuses to our named executive officers from time to time. We typically establish annual bonus targets based around a set of specified corporate goals for our named executive officers and conduct an annual performance review to determine the attainment of such goals. Our management may propose bonus awards to the compensation committee of the board or the board primarily based on such review process. Our compensation committee makes the final determination of the eligibility requirements for and the amount of such bonus awards. With respect to 2014, we awarded and paid bonuses of \$189,095 to Dr. Tung, \$106,514 to Ms. Stuart and \$88,647 to Mr. Daws, in each case as determined by our compensation committee based on our achievement of company goals, with such amounts representing 87% of their respective bonus targets.

*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.

We award our stock options on the date our board of directors or compensation committee approves the grant. We set the option exercise price and grant date fair value based on our per-share estimated valuation on the date of grant. For grants in connection with initial employment, vesting begins on the initial date of employment. Time vested stock option grants to our executives and other employees typically vest 25% on the first anniversary of grant or, if earlier, the initial employment date and 6.25% per quarter thereafter, through the fourth anniversary of the vesting commencement date, and have a term of 10 years from the grant date. In June 2014, our compensation committee granted options to purchase 203,300, 100,000 and 50,000 shares of our common stock to Dr. Tung, Ms. Stuart and Mr. Daws, respectively, as part of a review of their overall compensation. In addition, upon the closing of our initial public offering, or IPO, in February 2014, Mr. Daws received an option to purchase 123,893 shares of our common stock that had been approved by our board of directors in connection with his initial hire in January 2014. In 2013, we did not grant equity awards to any of our named executive officers.

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### OUTSTANDING EQUITY AWARDS AT YEAR END

The following table sets forth information regarding outstanding stock options held by our named executive officers as of December 31, 2014.

Name	Option awards			
	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.	28,495	—	1.13	12/11/2017
	53,097	—	4.58	12/19/2018
	38,052	—	4.41	12/10/2019
	29,202	—	3.79	12/14/2020
	29,867 <sup>(1)</sup>	9,955	3.50	12/15/2021
	— <sup>(2)</sup>	203,300	8.40	6/10/2024
Nancy Stuart	69,646	—	0.57	8/30/2016
	35,398	—	1.13	12/11/2017
	53,097	—	4.58	12/19/2018
	34,512	—	4.41	12/10/2019
	21,238	—	3.79	12/14/2020
	22,122 <sup>(1)</sup>	5,530	3.50	12/15/2021
Ryan Daws	— <sup>(2)</sup>	100,000	8.40	6/10/2024
	— <sup>(3)</sup>	123,893	14.09	2/19/2024
	— <sup>(2)</sup>	50,000	8.40	6/10/2024

- (1) This option vested as to 6.25% of the shares on March 15, 2012 and vests as to an additional 6.25% of the shares at the end of each successive three-month period through and including December 15, 2015.
- (2) This option vests as to 25% of the shares on June 10, 2015 and vests as to an additional 6.25% of the shares at the end of each successive three-month period through and including June 10, 2018.
- (3) This option vested as to 25% of the shares on January 20, 2015 and vests as to an additional 6.25% of the shares at the end of each successive three-month period through and including January 20, 2018.

### EMPLOYMENT AGREEMENTS, SEVERANCE AND CHANGE IN CONTROL ARRANGEMENTS

#### Employment agreements

We have entered into employment agreements with each of Dr. Tung, Ms. Stuart, Mr. Daws, and Dr. Silverman. 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 termination of employment under specified conditions. Each named executive officer's employment is at will.

#### Benefits provided upon termination without cause

Under the terms of the employment agreements we have entered into with each of Dr. Tung, Ms. Stuart, Mr. Daws, and Dr. Silverman, 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, prior to a change of control, as defined in such employment agreement, and subject to the executive's execution of a general release of potential claims against us, we will be obligated to (1) pay an amount equal to his or her then-current monthly base salary for a period of 12 months, any bonus that has been awarded to and earned by him or her but that has not been paid before termination, any base salary earned but not paid through the date of termination and any vacation time accrued but unused on the date of termination and (2) continue to provide medical and dental benefits to the extent that he or she was receiving them at the time of termination for up to 12 months, subject to certain legal restrictions.



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### Benefits provided upon a change of control

Under the terms of the employment agreements we have entered into with each of Dr. Tung, Ms. Stuart, Mr. Daws and Dr. Silverman, if the executive's employment is terminated by us or our successor without cause or by such executive officer for good reason, as defined in such employment agreement, within one year following a change of control, as defined in such employment agreement, and subject to the executive's execution of a general release of potential claims against us, in addition to the severance benefits described above:

- We will be obligated to pay the executive an amount equal to his or her target bonus, ratably in accordance with the severance payment.
- If the change of control constitutes a change in our ownership or effective control, or a change in the ownership of a substantial portion of our assets, each within the meaning of Treasury Regulation Section 409A, or a 409A change of control event, we will be obligated to pay the severance payment and target bonuses in a lump sum payment.

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

### 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 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 2015, 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 2015. 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 2015. The match immediately vests in full.

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### DIRECTOR COMPENSATION

In December 2013, our board of directors approved a director compensation program that became effective at the time of our IPO in February 2014. Under this director compensation program, we pay our non-employee directors retainers in cash. Each non-employee director receives a cash retainer for service on the board of directors and for service on each committee of which the director is a member. The chairmen of the board and of each committee 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 of directors and for service on each committee of the board of directors of which the director is a member are as follows:

	<b>Member Annual Fee</b>	<b>Chairman Annual Fee</b>
Board of Directors	\$30,000	\$ 60,000
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 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 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 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 our company. The exercise price of these options will equal the fair market value of our common stock on the date of grant.

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

Prior to our IPO in February 2014, we did not have a formal non-employee director compensation policy, however, we provided compensation for board service to Richard H. Aldrich, Ronald W. Barrett and Peter Barton Hutt in the form of an annual cash retainer and an equity stock option grant. Mr. Hutt received additional cash compensation for his service on board committees. None of our other non-employee directors received any compensation prior to our IPO, though we reimbursed our non-employee directors for reasonable travel and out-of-pocket expenses incurred in connection with attending board of director and committee meetings.

In accordance with our director compensation program, we granted options to purchase 25,000 shares of our common stock to each of Wendell Wierenga and Thomas G. Auchincloss, Jr., in March 2014 and December 2014, respectively, in connection with their appointments to our board of directors. We did not grant any other equity-based awards to our non-employee directors during 2014.

The compensation of our non-employee directors prior to our IPO was established through arm's length negotiation, taking into account the responsibilities of each director and the director's qualifications and prior experience and industry data for such positions. This compensation was approved by our compensation committee. We did not pay any compensation to our President and Chief Executive Officer in connection with his service on our board of directors prior to our IPO. The compensation that we paid to our President and Chief Executive Officer in 2014 is discussed above in this "Executive compensation" section.

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The following table sets forth information regarding compensation earned by our non-employee directors during 2014.

Name	Fees earned or paid		Option awards (\$) (1)	Total (\$)
	in cash (\$)			
Richard H. Aldrich	70,590		—	70,590
Thomas G. Auchincloss, Jr.	897		184,893	185,790
Ronald W. Barrett, Ph.D.	38,825		—	38,825
John G. Freund, M.D.	33,094		—	33,094
Peter Barton Hutt	32,648		—	32,648
Wilfred E. Jaeger, M.D.	37,506		—	37,506
Helmut M. Schühsler, Ph.D.	39,712		—	39,712
Wendell Wierenga, Ph.D.	26,400		217,428	243,828

(1) The amounts included in the “Option awards” column reflect the aggregate grant date fair value of awards granted during 2014 calculated in accordance with FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Note 7 to the consolidated financial statements included in this annual report on Form 10-K. As of December 31, 2014:

- Mr. Aldrich held stock options to purchase 21,236 shares of common stock in the aggregate, which were vested in full;
- Dr. Barrett held stock options to purchase 31,855 shares of common stock in the aggregate, which were vested in full;
- Mr. Hutt held stock options to purchase 36,279 shares of common stock in the aggregate, which were vested in full;
- Dr. Wierenga held a stock option to purchase 25,000 shares of common stock, which was vested as to 6,250 shares, with the remaining shares scheduled to vest in equal quarterly installments from March 13, 2015 to March 13, 2017.; and
- Mr. Auchincloss held a stock option to purchase 25,000 shares of common stock, which was scheduled to vest in equal quarterly installments over a three-year period through and including December 11, 2017.

## COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

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.

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

### SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth information regarding the beneficial ownership of our common stock as of February 20, 2015 by:

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

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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 February 20, 2015. 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 18,274,151 shares of common stock outstanding as of February 20, 2015. 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 February 20, 2015. We did not deem these shares outstanding, however, for the purpose of computing the percentage ownership of any other person.

<u>Name of beneficial owner</u>	<u>Number of shares beneficially owned</u>	<u>Percentage of shares beneficially owned</u>
<i>5% Stockholders</i>		
Entities affiliated with TVM Capital <sup>(1)</sup>	1,483,672	8.1%
Entities affiliated with GlaxoSmithKline <sup>(2)</sup>	1,356,533	7.4%
Skyline Venture Partners Qualified Purchaser Fund IV, L.P. <sup>(3)</sup>	1,208,920	6.6%
Entities affiliated with BVF, Inc. <sup>(4)</sup>	1,206,459	6.6%
Entities affiliated with Three Arch Partners <sup>(5)</sup>	1,138,854	6.2%
<i>Executive Officers and Directors</i>		
Roger D. Tung, Ph.D. <sup>(6)</sup>	802,948	4.4%
Nancy Stuart <sup>(7)</sup>	241,866	1.3%
Ryan Daws <sup>(8)</sup>	38,717	*
Richard H. Aldrich <sup>(9)</sup>	472,562	2.6%
Thomas G. Auchincloss <sup>(10)</sup>	2,083	*
Ronald W. Barrett, Ph.D. <sup>(11)</sup>	31,855	*
John G. Freund, M.D. <sup>(12)</sup>	1,208,920	6.6%
Peter Barton Hutt <sup>(13)</sup>	40,703	*
Wilfred E. Jaeger, M.D. <sup>(14)</sup>	1,138,854	6.2%
Helmut M. Schühlsler, Ph.D. <sup>(15)</sup>	1,483,672	8.1%
Wendell Wierenga, Ph.D. <sup>(16)</sup>	24,260	*
All current executive officers and directors as a group (13 persons) <sup>(17)</sup>	5,643,351	29.8%

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

(1) 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 Schühlsler, 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.

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- (2) *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.*
- (3) *Based on information set forth in a Schedule 13D filed with the Securities and Exchange Commission on February 17, 2015 by the following entities and individuals. John G. Freund and Yasunori Kaneko are the Managing Members of Skyline Venture Management IV, LLC, which is the sole general partner of Skyline Venture Partners Qualified Purchaser Fund IV, L.P., and as such Drs. Freund and Kaneko may be deemed to share voting and dispositive power with respect to all shares held by Skyline Venture Partners Qualified Purchaser Fund IV, L.P. Each of Drs. Freund and Kaneko disclaims 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 525 University Ave, Suite 610, Palo Alto, California 94301.*
- (4) *Based on information set forth in a Schedule 13G filed with the Securities and Exchange Commission on September 12, 2014 by the following entities and individual. Consists of (i) 559,400 shares of common stock beneficially owned by Biotechnology Value Fund, L.P. (“BVF”), (ii) 289,828 shares of common stock beneficially owned by Biotechnology Value Fund II, L.P. (“BVF2”), (iii) 155,990 shares of common stock beneficially owned by Investment 10, L.L.C. and (“ILL10”) and (iv) 201,241 shares of common stock beneficially owned by MSI BVF SPV, LLC (“MSI”). BVF Partners L.P. (“Partners”) as the general partner of BVF and BVF2, and the investment adviser of each of ILL10 and MSI, may be deemed to beneficially own the 1,206,459 shares of common stock beneficially owned in the aggregate by BVF, BVF2, ILL10 and MSI. BVF Inc., as the general partner of Partners, may be deemed to beneficially own the 1,206,459 shares of common stock beneficially owned by Partners. Mark N. Lampert, as a director and officer of BVF Inc., may be deemed to beneficially own the 1,206,459 shares of common stock beneficially owned by BVF Inc. Each of Partners, BVF Inc. and Mr. Lampert disclaims beneficial ownership of the shares of common stock beneficially owned by BVF, BVF2, ILL10 and MSI. The address for MSI is c/o Magnitude Capital, LLC, 601 Lexington Avenue, 59th Floor, New York, NY 10022 and the address for each of the other entities and for Mr. Lampert is 900 North Michigan Avenue, Suite 1100, Chicago, Illinois 60611.*
- (5) *Based on information set forth in a Schedule 13G filed with the Securities and Exchange Commission on February 17, 2015 by the following entities and individuals. Consists of 557,126 shares of common stock held by Three Arch Partners IV, L.P., 540,375 shares of common stock held by Three Arch Partners III, L.P., 29,052 shares of common stock held by Three Arch Associates III, L.P. and 12,301 shares of common stock held by Three Arch Associates IV, L.P. The voting and dispositive decisions with respect to the shares held by Three Arch Associates III, L.P. and Three Arch Partners III, L.P., are made by the following managing members of their general partner, Three Arch Management III, L.L.C.: Mark Wan and Wilfred Jaeger, each of whom disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. The voting and dispositive decisions with respect to the shares held by Three Arch Partners IV, L.P. and Three Arch Associates IV, L.P. are made by the following managing members of their general partner, Three Arch Management IV, L.L.C.: Mark Wan and Wilfred Jaeger, each of whom disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. The address for the funds affiliated with Three Arch Partners is 3200 Alpine Road, Portola Valley, CA 94028.*
- (6) *In addition to shares of common stock held directly, includes 134,761 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 152,707 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (7) *In addition to shares of common stock held directly, includes 231,866 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (8) *Consists of 38,717 shares of common stock issuable upon exercise of options exercisable within 60 days after February 20, 2015.*

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- (9) *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 Richard H. Aldrich Irrevocable Trust of 2011, for which Mr. Aldrich is a trustee and Mr. Aldrich's minor children are beneficiaries. Mr. Aldrich disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Includes 21,236 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (10) *Consists of 2,083 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (11) *Consists of 31,855 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (12) *Consists of the shares described in note (4) above. Dr. Freund is a Managing Member of Skyline Venture Management IV, LLC, which is the sole general partner of Skyline Venture Partners Qualified Purchaser Fund IV, L.P., and as such may be deemed to share voting and dispositive power with respect to all shares held by Skyline Venture Partners Qualified Purchaser Fund IV, L.P. Dr. Freund disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Dr. Freund's address is 525 University Ave, Suite 610, Palo Alto, California 94301.*
- (13) *Includes 36,279 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (14) *Consists of the shares described in note (6) above. Dr. Jaeger is a managing member of Three Arch Management III, L.L.C, the general partner of Three Arch Associates III, L.P. and Three Arch Partners III, L.P., and Three Arch Management IV, L.L.C, the general partner of Three Arch Partners IV, L.P. and Three Arch Associates IV, L.P. Dr. Jaeger disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Dr. Jaeger's address is 3200 Alpine Road, Portola Valley, CA 94028.*
- (15) *Consists of the shares described in note (2) above. Dr. Schühlsler is a member of the investment committee of TVM Life Science Ventures VI Management Limited Partnership, the general partner of TVM Life Science Ventures VI GMBH & Co. KG and TVM Life Science Ventures VI LP, and as such Dr. Schühlsler may be deemed to share voting and dispositive power with respect to all shares held by these entities Dr. Schühlsler disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Dr. Schühlsler's address is c/o TVM Capital GmbH, Maximilianstrasse 35, Entrance C, 80539 Munich, Germany.*
- (16) *Includes 11,871 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*
- (17) *Includes 692,020 shares of common stock issuable upon the exercise of options exercisable within 60 days after February 20, 2015.*

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### SECURITIES AUTHORIZED FOR ISSUANCE UNDER OUR EQUITY COMPENSATION PLANS

The following table provides information about the securities authorized for issuance under our equity compensation plans as of December 31, 2014.

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders	2,688,937 <sup>(1)</sup>	\$ 6.04	1,135,954 <sup>(2)</sup>
Equity compensation plans not approved by security holders	—	—	—
Total	<u>2,688,937</u>	<u>\$ 6.04</u>	<u>1,135,954</u>

- (1) Consists of stock options outstanding as of December 31, 2014 under our Amended and Restated 2006 Stock Option and Grant Plan and our 2014 Stock Incentive Plan, which we refer to as the 2006 Plan and the 2014 Plan, respectively.
- (2) Consists of shares of common stock authorized under the 2014 Plan that remained available for grant under future awards as of December 31, 2014. This amount does not include an additional 729,363 shares that became available for issuance under the 2014 Plan on January 1, 2015 in accordance with the terms of the 2014 Plan. The number of shares available under the 2014 Plan is subject to further increase by (i) the number of shares of our common stock subject to outstanding awards under the 2006 Plan that expire, terminate or are otherwise surrendered, cancelled, forfeited or repurchased and (ii) further annual increases, to be added on January 1 of each year, from and after 2016 through 2024, in each case equal to the lowest of (a) 2,000,000 shares of our common stock, (b) 4% of the number of our outstanding shares on January 1 of each such fiscal year and (c) an amount determined by our board of directors.

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

The following is a description of transactions since January 1, 2014 to which we have been a party, and in which any of our directors, executive officers or beneficial owners of more than 5% of our voting securities, or affiliates or immediate family members of any of our directors, executive officers or beneficial owners of more than 5% of our voting securities, had or will have a direct or indirect material interest. We believe the terms obtained or consideration that we paid or received, as applicable, in connection with the transactions described below were comparable to terms available or the amounts that would be paid or received, as applicable, from unrelated third parties.

### SEVERANCE AND CHANGE IN CONTROL AGREEMENTS

See the “Item 11. Executive Compensation—EMPLOYMENT AGREEMENTS, SEVERANCE AND CHANGE IN CONTROL ARRANGEMENTS” above for a discussion of these arrangements.

### INDEMNIFICATION OF OFFICERS AND DIRECTORS

Our certificate of incorporation provides that we will indemnify our directors and officers to the fullest extent permitted by Delaware law. In addition, we have entered into indemnification agreements with each of our directors and executive officers that may be broader in scope than the specific indemnification provisions contained in the Delaware General Corporation Law. These indemnification agreements require us, among other things, to indemnify each such director and executive officer for some expenses, including attorneys’ fees, judgments, fines and settlement amounts incurred by him or her in any action or proceeding arising out of his or

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her service as one of our directors or executive officers. In addition, we maintain standard policies of insurance under which coverage is provided to our directors and officers against losses arising from claims made by reason of breach of duty or other wrongful act, and to us with respect to payments which may be made by us to such directors and officers pursuant to the above indemnification provisions or otherwise as a matter of law.

### PURCHASES IN INITIAL PUBLIC OFFERING

In our IPO, beneficial owners of more than 5% of our voting securities and their affiliates purchased an aggregate of 831,000 shares of our common stock at the IPO price of \$14.00 per share. The following table sets forth the number of shares of our common stock purchased and the aggregate cash purchase price paid by each of these entities in our IPO.

<u>Purchaser</u>	<u>Shares of Common Stock</u>	<u>Purchase Price</u>
Brookside Capital Partners Fund, L.P.	350,000	\$ 4,900,000
S.R. One, Limited	35,000	\$ 490,000
Skyline Venture Partners Qualified Purchaser Fund IV, L.P. <sup>(1)</sup>	150,000	\$ 2,100,000
Entities affiliated with Three Arch Partners <sup>(2)</sup>	207,000	\$ 2,898,000
Entities affiliated with TVM Capital <sup>(3)</sup>	89,000	\$ 1,246,000

- (1) John G. Freund, a member of our board of directors, is a Managing Member of Skyline Venture Management IV, LLC, which is the sole general partner of Skyline Venture Partners Qualified Purchaser Fund IV, L.P.*
- (2) The purchase amounts disclosed on this line consist of the aggregate purchase amounts of Three Arch Associates III, L.P., Three Arch Partners III, L.P., Three Arch Associates IV, L.P. and Three Arch Partners IV, L.P. Wilfred E. Jaeger, a member of our board of directors, is a managing member of Three Arch Management III, L.L.C, the general partner of Three Arch Associates III, L.P. and Three Arch Partners III, L.P., and Three Arch Management IV, L.L.C, the general partner of Three Arch Partners IV, L.P. and Three Arch Associates IV, L.P.*
- (3) The purchase amounts disclosed on this line consist of the aggregate purchase amounts of TVM Life Science Ventures VI GMBH & Co. KG and TVM Life Science Ventures VI LP. Helmut M. Schühlsler, a member of our board of directors, is a member of the investment committee of TVM Life Science Ventures VI Management Limited Partnership, the general partner of TVM Life Science Ventures VI GMBH & Co. KG and TVM Life Science Ventures VI LP.*

### 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;



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- 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 and 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.

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### DIRECTOR INDEPENDENCE

Rule 5605 of the NASDAQ Listing Rules requires a majority of a listed company's board of directors to be comprised of independent directors within one year of listing. In addition, the NASDAQ Listing Rules require that, subject to specified exceptions, each member of a listed company's audit, compensation and nominating and corporate governance committees be independent that audit committee members also satisfy independence criteria set forth in Rule 10A-3 under the Exchange Act and that compensation committee members also satisfy heightened independence requirements contained in the NASDAQ Listing Rules as well as Rule 10C-1 under the Exchange Act.

Under Rule 5605(a)(2), a director will only qualify as an "independent director" if, in the opinion of our board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director.

In order to be considered independent for purposes of Rule 10A-3, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of the audit committee, the board of directors, or any other board committee, accept, directly or indirectly, any consulting, advisory, or other compensatory fee from the listed company or any of its subsidiaries or otherwise be an affiliated person of the listed company or any of its subsidiaries.

When determining the independence of the members of our compensation committee under the heightened independence requirements contained in the NASDAQ Listing Rules and Rule 10C-1, our board of directors is required to consider all factors specifically relevant to determining whether a director has a relationship with us that is material to that director's ability to be independent from management in connection with the duties of a compensation committee member, including, but not limited to: (1) the source of compensation of that director, including any consulting, advisory or other compensatory fee paid by us to that director; and (2) whether that director is affiliated with our company, a subsidiary of our company or an affiliate of a subsidiary of our company.

In December 2013, our board of directors undertook a review of the composition of our board of directors and its committees and the independence of each director. In January 2014, March 2014 and December 2014, our board of directors further considered the independence of John G. Freund, Wendell Wierenga and Thomas G. Auchincloss, Jr., respectively, in connection with their respective appointments to our board of directors. Based upon information requested from and provided by each director concerning his background, employment and affiliations, including family relationships, our board of directors has determined that each of our directors, with the exception of Dr. Tung, is an "independent director" as defined under Rule 5605(a)(2) of the NASDAQ Listing Rules. Our board of directors also determined that Thomas G. Auchincloss, Jr., John G. Freund and Wilfred E. Jaeger, who comprise our audit committee, and Richard H. Aldrich, Ronald W. Barrett and Wilfred E. Jaeger, who comprise our compensation committee, satisfy the independence standards for such committees established by the SEC and the NASDAQ Listing Rules, as applicable. In making such determinations, our board of directors considered the relationships that each such non-employee director has with our company and all other facts and circumstances our board of directors deemed relevant in determining independence, including the beneficial ownership of our capital stock by each non-employee director.

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### Item 14. Principal Accountant Fees and Services

#### AUDITORS' FEES

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	2014	2013
Audit Fees <sup>(1)</sup>	\$325,000	\$785,000
Audit-Related Fees	—	—
Tax Fees <sup>(2)</sup>	13,500	12,000
All Other Fees	2,000	—
Total Fees	<u>\$340,500</u>	<u>\$797,000</u>

(1) *Audit fees for 2014 and 2013 consist of fees for the audit of our consolidated financial statements and the review of our interim financial statements. Audit fees for 2013 also includes fees for services associated with our IPO.*

(2) *Tax fees consists of fees incurred for tax compliance and tax return preparation.*

All such accountant services and fees were pre-approved by our audit committee in accordance with the “Pre-Approval Policies and Procedures” described below.

#### PRE-APPROVAL POLICIES 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.

The audit committee has delegated to its chairman the authority to grant pre-approvals of audit or non-audit services to be provided by the independent auditor. Any approval of services by the chairman of the audit committee is reported to the committee at its next regularly scheduled meeting.

**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 2, 2015.

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:

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Roger D. Tung</u> Roger D. Tung, Ph.D.	Director, President and Chief Executive Officer (Principal Executive Officer)	March 2, 2015
<u>/s/ Ryan Daws</u> Ryan Daws	Chief Financial Officer (Principal Financial Officer)	March 2, 2015
<u>/s/ Pauline McGowan</u> Pauline McGowan	Vice President, Finance and Corporate Controller (Principal Accounting Officer)	March 2, 2015
<u>/s/ Richard H. Aldrich</u> Richard H. Aldrich	Chairman	March 2, 2015
<u>/s/ Thomas G. Auchincloss</u> Thomas G. Auchincloss	Director	March 2, 2015
<u>/s/ Ronald W. Barrett</u> Ronald W. Barrett, Ph.D.	Director	March 2, 2015
<u>/s/ John G. Freund</u> John G. Freund, M.D.	Director	March 2, 2015
<u>/s/ Peter Barton Hutt</u> Peter Barton Hutt	Director	March 2, 2015
<u>/s/ Wilfred E. Jaeger</u> Wilfred E. Jaeger, M.D.	Director	March 2, 2015
<u>/s/ Helmut M. Schühsler</u> Helmut M. Schühsler, Ph.D.	Director	March 2, 2015
<u>/s/ Wendell Wierenga</u> Wendell Wierenga, Ph.D.	Director	March 2, 2015

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### EXHIBIT INDEX

<u>Exhibit number</u>	<u>Description</u>
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)
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 #	Amended and Restated Employment Agreement, dated as of January 13, 2014, by and between the Registrant and Nancy Stuart (incorporated by reference to Exhibit 99.2 to the Registrant's current report on Form 8-K (File No. 001-36310), filed with the SEC on June 16, 2014)
10.11 #*	Amended and Restated Employment Agreement, dated as of June 16, 2014, by and between the Registrant D. Ryan Daws

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<u>Exhibit number</u>	<u>Description</u>
10.12 #	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. Schühler 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)
10.13*	Loan and Security Agreement, dated as of December 22, 2011, between the Registrant and Hercules Technology Growth Capital, Inc., as amended
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 †	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)
10.19 #	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)
10.20 #*	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.

† 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.



June 16, 2014

D. Ryan Daws  
c/o  
Concert Pharmaceuticals, Inc.  
99 Hayden Avenue, Suite 500  
Lexington, MA 02421

Dear Mr. Daws:

This agreement revises the terms of your continued employment as Chief Financial Officer of Concert Pharmaceuticals, Inc. (the "**Company**" or "**Concert**" and, with you, the "**Parties**") reporting to the Company's Chief Executive Officer, effective as of June 10, 2014 (the "**Effective Date**"). You agree to continue to perform the duties of your position and such other duties as the Company's Board of Directors (the "**Board**") may reasonably assign to you from time to time.

At Concert you will develop strategies for company financing and represent the Company on financial and corporate strategy matters in dealings with investors and analysts, including public offerings the Company may pursue. You will serve as a key advisor to the Chief Executive Officer and Board of Directors and assist with the development and execution of the overall strategy and direction of the Company. Also, you will lead all financial operations of the company, including financial planning and budgeting, accounting and reporting, and investment management. In addition, as the Company may require, you will lead business development activities in collaboration with Concert's senior management team.

1. **Salary**. You will receive annualized base salary of \$308,000 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 are 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.

In addition, the Company paid you a one-time signing bonus of ninety-seven thousand dollars (\$97,000.00) in a lump sum. If your employment ends within the first 12 months after your date of employment because of your voluntary resignation (other than on a resignation for Good Reason) or because the Company terminates your employment for Cause, you agree to reimburse Concert the ninety-seven thousand dollar signing bonus, net of any taxes the Company withheld on such bonus, within two months following such termination.



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. You confirm that you have received the Option referenced in the January 16, 2014 version of this Agreement.

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 January 20, 2014 (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

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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 promptly 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 and target bonus 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 contendere* 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 January 16, 2014 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 16, 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,

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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. You too are permitted to share a copy of the Confidentiality Agreement (or portions thereof) to the extent necessary to highlight your continuing obligations to the Company.

(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, including the version of this Agreement entered into as January 16, 2014.

*Signatures on Following Page*

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Very truly yours,

/s/ Roger D. Tung

Roger D. Tung  
President and Chief Executive Officer

Agreed and Accepted:

Signature:

/s/ D. Ryan Daws

D. Ryan Daws

6/16/2014

Date:

LOAN AND SECURITY AGREEMENT

THIS LOAN AND SECURITY AGREEMENT is made and dated as of December 22, 2011 and is entered into by and between **CONCERT PHARMACEUTICALS, INC.**, a Delaware corporation, and each of its subsidiaries other than Concert Pharmaceuticals Securities Corporation, (hereinafter collectively referred to as the “Borrower”), and **HERCULES TECHNOLOGY GROWTH CAPITAL, INC.**, a Maryland corporation (“Lender”).

**RECITALS**

A. Borrower has requested Lender to make available to Borrower a loan in an aggregate principal amount of up to \$20,000,000 (the “Term Loan”); and

B. Lender is willing to make the Term Loan on the terms and conditions set forth in this Agreement.

**AGREEMENT**

NOW, THEREFORE, Borrower and Lender agree as follows:

**SECTION 1. DEFINITIONS AND RULES OF CONSTRUCTION**

1.1 Unless otherwise defined herein, the following capitalized terms shall have the following meanings:

“Account Control Agreement(s)” means any agreement entered into by and among the Lender, Borrower and a third party Bank or other institution (including a Securities Intermediary) in which Borrower maintains a Deposit Account or an account holding Investment Property and which grants Lender a perfected first priority security interest in the subject account or accounts.

“ACH Authorization” means the ACH Debit Authorization Agreement in substantially the form of Exhibit H.

“Advance(s)” means a Term Advance.

“Advance Date” means the funding date of any Advance.

“Advance Request” means a request for an Advance submitted by Borrower to Lender in substantially the form of Exhibit A.

“Agreement” means this Loan and Security Agreement, as amended from time to time.

“Assignee” has the meaning given to it in Section 11.13.

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“Borrower Products” means all products, technical data or technology currently being developed, manufactured or sold by Borrower or which Borrower intends to sell, manufacture, license, or distribute in the future including any products or service offerings under development, collectively, together with all products, technical data or technology that have been sold, developed, licensed or distributed by Borrower since its incorporation.

“Cash” means all cash and liquid funds.

“Change in Control” means any (i) reorganization, recapitalization, consolidation or merger (or similar transaction or series of related transactions) of Borrower in which the holders of Borrower’s outstanding shares immediately before consummation of such transaction or series of related transactions (together with any affiliates of such holders) do not, immediately after consummation of such transaction or series of related transactions, retain shares representing more than fifty percent (50%) of the voting power of the surviving entity of such transaction or series of related transactions (or the parent of such surviving entity if such surviving entity is wholly owned by such parent), in each case without regard to whether Borrower is the surviving entity, or (ii) sale or issuance by Borrower of new shares of Preferred Stock of Borrower to investors, none of whom are current investors in Borrower (or their affiliates), representing more than fifty percent (50%) of the voting power of the surviving entity (or the parent of such surviving entity if such surviving entity is wholly owned by such parent); provided, however, none of (a) an Initial Public Offering or (b) a bona fide equity financing for the purpose of raising capital from institutional investors reasonably acceptable to Lender, shall not constitute a Change in Control.

“Claims” has the meaning given to it in Section 11.10.

“Closing Date” means the date of this Agreement.

“Collateral” means the property described in Section 3.

“Commitment Fee” means \$20,000, which fee Lender received prior to the Closing Date, and shall be deemed fully earned on such date regardless of the early termination of this Agreement.

“Confidential Information” has the meaning given to it in Section 11.12.

“Contingent Obligation” means, as applied to any Person, any direct or indirect liability, contingent or otherwise, of that Person with respect to (i) any Indebtedness of another, including any such obligation guaranteed, endorsed, co-made or discounted or sold with recourse by that Person, or in respect of which that Person is otherwise directly or indirectly liable; (ii) any obligations with respect to undrawn letters of credit, corporate credit cards or merchant services issued for the account of that Person; and (iii) all obligations arising under any interest rate, currency or commodity swap agreement, interest rate cap agreement, interest rate collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; provided, however, that the term “Contingent Obligation” shall not include endorsements for collection or deposit in the ordinary course of business. The amount of any Contingent Obligation shall be deemed to be an amount

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equal to the stated or determined amount of the primary obligation described in clauses (i) and (ii) above in respect of which such Contingent Obligation is made or, if not stated or determinable, the maximum reasonably anticipated liability in respect thereof as determined by such Person in good faith; provided, however, that such amount shall not in any event exceed the maximum amount of the obligations under the guarantee or other support arrangement.

“Copyright License” means any written agreement granting any right to use any Copyright or Copyright registration, now owned or hereafter acquired by Borrower or in which Borrower now holds or hereafter acquires any interest.

“Copyrights” means all copyrights, whether registered or unregistered, held pursuant to the laws of the United States, any State thereof, or of any other country.

“Deposit Accounts” means any “deposit accounts,” as such term is defined in the UCC, and includes any checking account, savings account, or certificate of deposit.

“ERISA” is the Employee Retirement Income Security Act of 1974, and its regulations, as amended and in effect from time to time.

“Event of Default” has the meaning given to it in Section 9.

“Facility Charge” means 0.75% of the Maximum Term Loan Amount.

“Financial Statements” has the meaning given to it in Section 7.1.

“GAAP” means generally accepted accounting principles in the United States of America, as in effect from time to time, provided that the parties agree that GAAP as in effect on the date of this Agreement shall be applicable for the interpretation of “capital lease obligations” in the definition of “Indebtedness”, unless the parties otherwise agree in writing.

“Grant Document” means an instrument or agreement providing that the Borrower or another Person or both shall provide funding for or share the costs of programs identified in such instruments or agreements entered into in the OCB.

“Grant Requirements” means all obligations of Borrower to provide funding for or share the costs of, programs identified in Grant Documents or to perform other obligations thereunder.

“GSK Agreement” means that certain Research and Development Collaboration and License Agreement by and between Glaxo Group Limited and Concert Pharmaceuticals dated May 29, 2009, as amended.

“Indebtedness” means (a) all indebtedness for borrowed money or the deferred purchase price of property or services (excluding trade credit entered into in the ordinary course of business due within ninety (90) days), including reimbursement and other obligations with respect to surety bonds and letters of credit, (b) all obligations evidenced by notes, bonds, debentures or similar instruments, (c) all capital lease obligations, and (d) all Contingent Obligations.

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“Initial Public Offering” means an initial firm commitment underwritten offering of Borrower’s common stock pursuant to a registration statement under the Securities Act of 1933 filed with and declared effective by the Securities and Exchange Commission.

“Insolvency Proceeding” is any proceeding by or against any Person under the United States Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments of all or substantially all of a Person’s assets for the benefit of creditors, compositions, extensions generally with its creditors, or proceedings seeking reorganization, arrangement, or other similar relief.

“Intellectual Property” means all of Borrower’s Copyrights; Trademarks; Patents; Licenses; trade secrets, proprietary information (including pre-clinical, clinical and other data) and inventions; mask works; Borrower’s applications therefor and reissues, extensions, or renewals thereof; and Borrower’s goodwill associated with any of the foregoing, together with Borrower’s rights to sue for past, present and future infringement of Intellectual Property and the goodwill associated therewith.

“Interest Rate” means for any day a per annum rate of interest equal to the greater of either (i) 8.50% plus the United States Prime Rate as reported in The Wall Street Journal minus 5.25%, and (ii) 8.50%; provided, however, the Interest Rate shall in no case exceed 11.0% per annum.

“Investment” means any beneficial ownership (including stock, partnership or limited liability company interests) of or in any Person, or any loan, advance or capital contribution to any Person or the acquisition of all, or substantially all, of the assets of another Person.

“Joinder Agreements” means for each Subsidiary (other than Concert Pharmaceuticals Securities Corp.), a completed and executed Joinder Agreement in substantially the form attached hereto as Exhibit G.

“Lender” has the meaning given to it in the preamble to this Agreement.

“License” means any Copyright License, Patent License, Trademark License or other license of rights or interests from a third party.

“Lien” means any mortgage, deed of trust, pledge, hypothecation, assignment for security, security interest, encumbrance, levy, lien or charge of any kind, whether voluntarily incurred or arising by operation of law or otherwise, against any property, any conditional sale or other title retention agreement, and any lease in the nature of a security interest.

“Loan” means the Advances made under this Agreement.

“Loan Documents” means this Agreement, the Notes, the ACH Authorization, the Account Control Agreements, the Joinder Agreements, all UCC Financing Statements and any other documents executed in connection with the Secured Obligations or the transactions contemplated hereby (excluding the Warrant), as the same may from time to time be amended, modified, supplemented or restated.

“Material Adverse Effect” means an occurrence, on or after the date of the last set of audited financials, that has a material adverse effect upon: (i) the business, operations, properties, assets or condition (financial or otherwise) of the Borrower and its Subsidiaries, taken as a whole, other than an effect in and of itself reasonably attributable to (a) adverse results or delays in any nonclinical or clinical trial, including without limitation failure to demonstrate the desired safety or efficacy of any biologic or drug; (b) the denial, delay or limitation of approval of, or taking of any other regulatory action by, the United States Food and Drug Administration or any other governmental entity with respect to any biologic or drug; (c) a change in or discontinuation of a strategic partnership or other collaboration or license arrangement; or (d) a going concern qualification in a financial statement or audit report resulting solely from Borrower and its Subsidiaries having less than twelve months of cash; or (ii) the ability of Borrower to perform the Secured Obligations when due in accordance with the terms of the Loan Documents, or the ability of Lender to enforce any of its rights or remedies with respect to the Secured Obligations; or (iii) the Collateral or Lender’s Liens on the Collateral or the priority of such Liens, in each case, in the aggregate; it being understood that in the case of each of items (ii) and (iii) the effects listed in clauses (i)(a) through (d) of this definition shall be disregarded.

“Maturity Date” means July 1, 2015, provided Maturity Date will mean October 1, 2015 if the interest-only period is extended pursuant to Section 2.1(d).

“Maximum Term Loan Amount” means \$20,000,000.

“Maximum Rate” shall have the meaning assigned to such term in Section 2.3.

“Note(s)” means a Term Note.

“OCB” means in the ordinary course of business and shall include collaboration or licensing transactions that are customary in the Borrower’s industry such as, or comparable with or lesser in scope than, the Borrower’s existing collaboration with GlaxoSmithKline.

“Patent License” means any written agreement granting any right with respect to any invention on which a Patent is in existence or a Patent application is pending, in which agreement Borrower now holds or hereafter acquires any interest.

“Patents” means all letters patent of, or rights corresponding thereto, in the United States or in any other country, all registrations and recordings thereof, and all applications for letters patent of, or rights corresponding thereto, in the United States or any other country.

“Permitted Indebtedness” means: (i) Indebtedness of Borrower arising under this Agreement or any other Loan Document; (ii) Indebtedness existing on the Closing Date which is disclosed in Schedule 1A; (iii) Indebtedness in the principal amount of up to \$200,000

outstanding at any time secured by a lien described in clause (vii) of the defined term “Permitted Liens,”; (iv) Indebtedness to trade creditors incurred in the ordinary course of business, including Indebtedness incurred in the ordinary course of business with corporate credit cards; (v) Indebtedness that also constitutes a Permitted Investment; (vi) Subordinated Indebtedness; (vii) reimbursement obligations in connection with letters of credit that are secured by cash or cash equivalents and issued on behalf of the Borrower or a Subsidiary thereof in an amount not to exceed \$906,000 at any time outstanding; (viii) other Indebtedness in an amount not to exceed \$250,000 at any time outstanding; (ix) Contingent Obligations of up to \$200,000 described on clause (iii) of the definition of Contingent Obligations entered into to mitigate risk and not for speculative purposes; (x) Grant Requirements; (xi) Indebtedness among Borrowers or of Borrower to any non-Borrower Subsidiary; and (xii) extensions, refinancings and renewals of any items of Permitted Indebtedness, provided that the principal amount is not increased or the terms modified to impose materially more burdensome terms upon Borrower or its Subsidiary, as the case may be.

“Permitted Investment” means: (i) Investments existing on the Closing Date which are disclosed in Schedule 1B; (ii) (a) marketable direct obligations issued or unconditionally guaranteed by the United States of America or any agency or any State thereof maturing within twenty four months from the date of acquisition thereof, (b) commercial paper maturing no more than 270 days from the date of creation thereof and at the time of the Investment having a rating of at least A-2 or P-2 from either Standard & Poor’s Corporation or Moody’s Investors Service, (c) certificates of deposit issued by any bank with assets of at least \$500,000,000 maturing no more than twenty four months from the date of investment therein, (d) money market accounts; and (e) corporate debt obligations maturing no more than 24 months from the date of acquisition thereof and at the time of investment having a rating of at least A3 or A- from either Standard & Pools or Moody’s Investor Service; (iii) repurchases of stock from former employees, directors, or consultants of Borrower under agreements approved by the Borrower’s board of directors in an aggregate amount not to exceed \$250,000 in any fiscal year, provided that no Event of Default has occurred, is continuing or would exist after giving effect to the repurchases; (iv) Investments accepted in connection with Permitted Transfers; (v) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of customers or suppliers and in settlement of delinquent obligations of, and other disputes with, customers or suppliers arising in the ordinary course of Borrower’s business; (vi) Investments consisting of notes receivable of, or prepaid royalties and other credit extensions, to customers and suppliers who are not affiliates, in the ordinary course of business, provided that this subparagraph (vi) shall not apply to Investments of Borrower in any Subsidiary; (vii) Investments consisting of loans not involving the net transfer on a substantially contemporaneous basis of cash proceeds to employees, officers or directors relating to the purchase of capital stock of Borrower pursuant to employee stock purchase plans or other similar agreements approved by Borrower’s Board of Directors; (viii) Investments consisting of travel advances or moving expenses in the ordinary course of business; (ix) Investments in existing or newly-formed Subsidiaries organized in the United States, provided that such Subsidiaries enter into a Joinder Agreement and execute such other documents as shall be reasonably requested by Lender and de minimis Investments in Concert Pharmaceuticals Securities Corporation in connection with its liquidation or dissolution; (x) Investments in subsidiaries organized outside of the United States approved in advance in writing by Lender; (xi) licenses, joint ventures, collaboration agreements, strategic alliances and



similar arrangements in the OCB providing for the exclusive or nonexclusive licensing of technology, Intellectual Property, or Borrower Products, the development of technology, Intellectual Property or Borrower Products, the assignment of ownership or co-ownership rights in connection with the foregoing, or the providing of technical support, provided that any cash Investments by Borrower in another Person (other than a Subsidiary that has entered into a Joinder pursuant to the terms hereof) as part of the foregoing do not exceed \$100,000 in the aggregate in any fiscal year; (xii) Investments made pursuant to any investment policy adopted by a Borrower after the Closing Date and approved by Lender; (xiii) Investments of up to \$200,000 in the aggregate at any time outstanding in connection with Grant Requirements; (xiv) Investments by Borrower in another Borrower; and (xv) additional Investments that do not exceed \$250,000 in the aggregate per fiscal year.

“Permitted Liens” means any and all of the following: (i) Liens in favor of Lender; (ii) Liens existing on the Closing Date which are disclosed in Schedule 1C; (iii) Liens for taxes, fees, assessments or other governmental charges or levies, either not delinquent or being contested in good faith by appropriate proceedings; provided, that Borrower maintains adequate reserves therefor in accordance with GAAP; (iv) Liens securing claims or demands of materialmen, artisans, mechanics, carriers, warehousemen, landlords and other like Persons arising in the ordinary course of Borrower’s business and imposed without action of such parties; provided, that the payment thereof is not yet required; (v) Liens arising from judgments, decrees or attachments in circumstances which do not constitute an Event of Default hereunder; (vi) the following deposits, to the extent made in the ordinary course of business: deposits under worker’s compensation, unemployment insurance, social security and other similar laws, or to secure the performance of bids, tenders or contracts (other than for the repayment of borrowed money) or to secure indemnity, performance or other similar bonds for the performance of bids, tenders or contracts (other than for the repayment of borrowed money) or to secure statutory obligations (other than liens arising under ERISA or environmental liens) or surety or appeal bonds, or to secure indemnity, performance or other similar bonds; (vii) Liens on Equipment or software, other intellectual property, or other capital assets, constituting purchase money liens and liens in connection with capital leases securing Indebtedness permitted in clause (iii) of “Permitted Indebtedness”; (viii) Liens incurred in connection with Subordinated Indebtedness; (ix) leasehold interests in leases or subleases and licenses granted in the OCB and not interfering in any material respect with the business of the licensor; (x) Liens in favor of customs and revenue authorities arising as a matter of law to secure payment of custom duties that are promptly paid on or before the date they become due; (xi) Liens on insurance proceeds securing the payment of financed insurance premiums that are promptly paid on or before the date they become due (provided that such Liens extend only to such insurance proceeds and not to any other property or assets); (xii) statutory, common law and contractual rights of set-off and other similar rights as to deposits of cash and securities in favor of banks, other depository institutions and brokerage firms; (xiii) easements, zoning restrictions, rights-of-way and similar encumbrances on real property imposed by law or arising in the ordinary course of business so long as they do not materially impair the value or marketability of the related property; (xiv) Liens on cash or cash equivalents securing obligations permitted under clause (vii) of the definition of Permitted Indebtedness; (xv) Liens in connection with operating leases in the Equipment that is the subject of such leases; (xvi) Permitted Transfers; and (xvii) Liens incurred in connection with the extension, renewal or refinancing of the indebtedness secured by Liens of the type described in

clauses (i) through (xvi) above; provided, that any extension, renewal or replacement Lien shall be limited to the property encumbered by the existing Lien and the principal amount of the indebtedness being extended, renewed or refinanced (as may have been reduced by any payment thereon) does not increase.

“Permitted Transfers” means (i) sales of Inventory in the normal course of business, (ii) exclusive or non-exclusive licenses, joint ventures, collaboration agreements, strategic alliances and similar arrangements in the OCB providing for the exclusive or nonexclusive licensing of technology, Intellectual Property or Borrower Products, the development of technology, Intellectual Property or Borrower Products, the assignment of ownership or co-ownership rights in connection with the foregoing, or the providing of technical support, (iii) dispositions of worn-out, obsolete or surplus Equipment at fair market value in the ordinary course of business, (iv) Permitted Investments, (v) Permitted Liens, (vi) dispositions of Copyright rights in connection with publications in scientific journals, and (vii) other Transfers of assets having a fair market value of not more than \$250,000 in the aggregate in any fiscal year.

“Person” means any individual, sole proprietorship, partnership, joint venture, trust, unincorporated organization, association, corporation, limited liability company, institution, other entity or government.

“Preferred Stock” means at any given time any equity security issued by Borrower that has any rights, preferences or privileges senior to Borrower’s common stock.

“Prepayment Charge” shall have the meaning assigned to such term in Section 2.5.

“Receivables” means all of Borrower’s Accounts, Instruments, Documents, Chattel Paper, Supporting Obligations, letters of credit, proceeds of any letter of credit, and Letter of Credit Rights.

“Secured Obligations” means Borrower’s obligations under this Agreement and any Loan Document, including any obligation to pay any amount now owing or later arising.

“Subordinated Indebtedness” means Indebtedness subordinated to the Secured Obligations in amounts and on terms and conditions satisfactory to Lender in its sole discretion.

“Subsidiary” means an entity, whether corporate, partnership, limited liability company, joint venture or otherwise, in which Borrower owns or controls more than 50% of the outstanding voting securities, including each entity listed on Schedule 1 hereto.

“Term Advance” means any Term Loan funds advanced under this Agreement.

“Term Note” means a Promissory Note in substantially the form of Exhibit B-1.

“Trademark License” means any written agreement granting any right to use any Trademark or Trademark registration, now owned or hereafter acquired by Borrower or in which Borrower now holds or hereafter acquires any interest.

“Trademarks” means all trademarks (registered, common law or otherwise) and any applications in connection therewith, including registrations, recordings and applications in the United States Patent and Trademark Office or in any similar office or agency of the United States, any State thereof or any other country or any political subdivision thereof.

“UCC” means the Uniform Commercial Code as the same is, from time to time, in effect in the Commonwealth of Massachusetts; provided, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection or priority of, or remedies with respect to, Lender’s Lien on any Collateral is governed by the Uniform Commercial Code as the same is, from time to time, in effect in a jurisdiction other than the Commonwealth of Massachusetts, then the term “UCC” shall mean the Uniform Commercial Code as in effect, from time to time, in such other jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority or remedies and for purposes of definitions related to such provisions.

“Warrant” means the warrant entered into in connection with the Loan.

Unless otherwise specified, all references in this Agreement or any Annex or Schedule hereto to a “Section,” “subsection,” “Exhibit,” “Annex,” or “Schedule” shall refer to the corresponding Section, subsection, Exhibit, Annex, or Schedule in or to this Agreement. Unless otherwise specifically provided herein, any accounting term used in this Agreement or the other Loan Documents shall have the meaning customarily given such term in accordance with GAAP, and all financial computations hereunder shall be computed in accordance with GAAP, consistently applied. Unless otherwise defined herein or in the other Loan Documents, terms that are used herein or in the other Loan Documents and defined in the UCC shall have the meanings given to them in the UCC.

## **SECTION 2. THE LOAN**

### **2.1 Term Loan.**

(a) Advances. Subject to the terms and conditions of this Agreement, Lender will make, and Borrower agrees to draw, a Term Advance of \$7,500,000 (the “First Tranche”) on the Closing Date. Beginning on the Closing Date, and continuing through March 31, 2012, Borrower may request one additional Term Advance in an aggregate amount up to \$12,500,000 (the “Second Tranche”). The aggregate outstanding Term Advances may be up to the Maximum Term Loan Amount.

(b) Advance Request. To obtain a Term Advance, Borrower shall complete, sign and deliver an Advance Request (which, as to the Second Tranche, shall be at least five business days before the Advance Date) and Term Note to Lender. Lender shall fund the Term Advance in the manner requested by the Advance Request provided that each of the conditions precedent in Section 4 of this Agreement applicable to such Term Advance is satisfied as of the requested Advance Date.

(c) Interest. The principal balance of each Term Advance shall bear interest thereon from such Advance Date at the Interest Rate based on a year consisting of 360 days, with interest computed daily based on the actual number of days elapsed. The Interest Rate will float and change on the day the Prime Rate changes from time to time.

(d) Payment. Borrower will pay interest on each Term Advance in arrears on the first business day of each month, beginning the month after the Advance Date and ending on January 3, 2013 (the "Interest Only Period"). Borrower shall repay the aggregate Term Loan principal balance that is outstanding on the first anniversary of the Closing Date in 30 equal monthly installments of principal and interest beginning February 1, 2013 and continuing on the first business day of each month thereafter. Notwithstanding the foregoing, Borrower may elect to postpone the date on which the first such installment is due until May 1, 2013, (and the last payment date of the Interest Only Period shall be April 1, 2013), provided Borrower has begun the Proof of Concept study for CTP-499, meaning that the first patient has been enrolled in a clinical study in which subjects with diabetes and reduced kidney function are randomly assigned to receive either placebo or CTP-499 treatment. The entire Term Loan principal balance and all accrued but unpaid interest hereunder, shall be due and payable on Maturity Date. Borrower shall make all payments under this Agreement without setoff, recoupment or deduction and regardless of any counterclaim or defense. Lender will initiate debit entries to the Borrower's account as authorized on the ACH Authorization on each payment date of all periodic obligations payable to Lender under each Term Note or Term Advance.

2.2 Maximum Interest. Notwithstanding any provision in this Agreement, the Notes, or any other Loan Document, it is the parties' intent not to contract for, charge or receive interest at a rate that is greater than the maximum rate permissible by law that a court of competent jurisdiction shall deem applicable hereto (which under the laws of the Commonwealth of Massachusetts shall be deemed to be the laws relating to permissible rates of interest on commercial loans) (the "Maximum Rate"). If a court of competent jurisdiction shall finally determine that Borrower has actually paid to Lender an amount of interest in excess of the amount that would have been payable if all of the Secured Obligations had at all times borne interest at the Maximum Rate, then such excess interest actually paid by Borrower shall be applied as follows: first, to the payment of principal outstanding on the Notes; second, after all principal is repaid, to the payment of Lender's accrued interest, costs, expenses, professional fees and any other Secured Obligations; and third, after all Secured Obligations are repaid, the excess (if any) shall be refunded to Borrower.

2.3 Default Interest. In the event any payment is not paid on the scheduled payment date, an amount equal to five percent (5%) of the past due amount shall be payable on demand. Upon the occurrence and during the continuation of an Event of Default hereunder, all Secured Obligations, including principal, interest, compounded interest, and professional fees, shall bear interest at a rate per annum equal to the rate set

forth in Section 2.1(c) plus five percent (5%) per annum. In the event any interest is not paid when due hereunder, delinquent interest shall be added to principal and shall bear interest on interest, compounded at the rate set forth in Section 2.1(c).

2.4 Prepayment. At its option upon at least 7 business days prior notice to Lender, Borrower may prepay all, but not less than all, of the outstanding Advances by paying the entire principal balance, all accrued and unpaid interest, together with a prepayment charge equal to the following percentage of the Advance amount being prepaid: if such Advance amounts are prepaid in any of the first twelve (12) months following the Closing Date, 3.0%; after twelve (12) months but prior to twenty four (24) months, 2.0%; and thereafter, 1.0% (each, a "Prepayment Charge"). Borrower agrees that the Prepayment Charge is a reasonable calculation of Lender's lost profits in view of the difficulties and impracticality of determining actual damages resulting from an early repayment of the Advances. Borrower shall prepay the outstanding amount of all principal and accrued interest through the prepayment date and the Prepayment Charge upon demand of the Lender made no later than 30 days following a Change in Control.

### **SECTION 3. SECURITY INTEREST**

3.1 As security for the prompt and complete payment when due (whether on the payment dates or otherwise) of all the Secured Obligations, Borrower grants to Lender a security interest in all of Borrower's personal property now owned or hereafter acquired, including the following (collectively, the "Collateral"): (a) Receivables; (b) Equipment; (c) Fixtures; (d) General Intangibles (other than Intellectual Property); (e) Inventory; (f) Investment Property (but excluding thirty-five percent (35%) of the capital stock of any foreign Subsidiary that constitutes a Permitted Investment); (g) Deposit Accounts; (h) Cash; (i) Goods; and other tangible and intangible personal property of Borrower whether now or hereafter owned or existing, or acquired by, Borrower and wherever located; and, to the extent not otherwise included, all Proceeds of each of the foregoing and all accessions to, substitutions and replacements for, and rents, profits and products of each of the foregoing. Notwithstanding any of the foregoing, the Collateral shall not under any circumstance include, and no security interest is granted in (i) Borrower's Intellectual Property, provided, however, that the Collateral shall include all Accounts and General Intangibles that consist of rights to payment and proceeds from the sale, licensing or disposition of all or any part, or rights in, the Borrower's Intellectual Property (the "Rights to Payment"); (ii) any capital stock of any foreign subsidiary that constitutes a Permitted Investment in excess of 65% of such capital stock, provided that Lender's taking a security interest in more than 65% of such stock would be reasonably expected to cause Borrower to incur adverse tax consequences; (iii) any assets of Borrower that both (x) consist of compounds and raw materials used to manufacture biopharmaceuticals or which are used for preclinical testing or clinical trials, and (y) are located outside of the United States, if and for so long as the grant of such security interest is prohibited by or requires a consent under any applicable requirement of law of a jurisdiction other than the United States or any state or other subdivision thereof, provided that the Borrower shall not be required to undertake any steps under the laws of any applicable foreign jurisdiction with respect to the creation, perfection or priority of the Secured Party's security interests in such assets; (iv) equipment

financed by capital leases or purchase money financing and all Borrower's books and records relating to the foregoing, and any and all claims, rights and interest in such assets and all substitutions for, additions, attachments, accessories, accessions and improvements to and replacements, products, proceeds and insurance proceeds of any or all of the foregoing; and (v) any cash or cash equivalents described in clause (vii) of the definition of Permitted Indebtedness. Notwithstanding the foregoing, if a judicial authority (including a U.S. Bankruptcy Court) holds that a security interest in the underlying Intellectual Property is necessary to have a security interest in the Rights to Payment, then the Collateral shall automatically, and effective as of the date of this Agreement, include the Intellectual Property to the extent necessary to permit perfection of Lender's security interest in the Rights to Payment, except to the extent that such inclusion as Collateral could be inconsistent with or conflict with the GSK Agreement or any agreement entered into in connection with a Permitted Transfer or interfere with the parties' rights and remedies thereunder.

#### **SECTION 4. CONDITIONS PRECEDENT TO LOAN**

The obligations of Lender to make the Loan hereunder are subject to the satisfaction by Borrower of the following conditions:

4.1 Initial Advance. On or prior to the Closing Date, Borrower shall have delivered to Lender the following:

- (a) executed originals of the Loan Documents, Account Control Agreements, a legal opinion of Borrower's counsel, and all other documents and instruments reasonably required by Lender to effectuate the transactions contemplated hereby or to create and perfect the Liens of Lender with respect to all Collateral, in all cases in form and substance reasonably acceptable to Lender;
- (b) certified copy of resolutions of Borrower's board of directors evidencing approval of (i) the Loan and other transactions evidenced by the Loan Documents; and (ii) the Warrant and transactions evidenced thereby;
- (c) certified copies of the Certificate of Incorporation and the Bylaws, as amended through the Closing Date, of Borrower;
- (d) a certificate of good standing for Borrower from its state of incorporation and similar certificates from all other jurisdictions in which it does business and where the failure to be qualified would have a Material Adverse Effect;
- (e) payment of the Facility Charge and reimbursement of Lender's current expenses reimbursable pursuant to this Agreement, which amounts may be deducted from the initial Advance; and
- (f) such other documents as Lender may reasonably request.

4.2 All Advances. On each Advance Date:

(a) Lender shall have received an Advance Request and a Note for the relevant Advance as required by Section 2.1(b), as applicable, each duly executed by Borrower's Chief Executive Officer, Chief Operating Officer or Chief Financial Officer.

(b) The representations and warranties set forth in this Agreement and in Section 5 of this Agreement shall be true and correct in all material respects on and as of the Advance Date with the same effect as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date.

(c) Borrower shall be in compliance in all material respects with all the terms and provisions set forth herein and in each other Loan Document on its part to be observed or performed, and at the time of and immediately after such Advance no Event of Default shall have occurred and be continuing.

(d) Each Advance Request shall be deemed to constitute a representation and warranty by Borrower on the relevant Advance Date as to the matters specified in paragraphs (b) and (c) of this Section 4.2 and as to the matters set forth in the Advance Request.

4.3 No Default. As of the Closing Date and each Advance Date, as applicable, (i) no fact or condition exists that would (or would, with the passage of time, the giving of notice, or both) constitute an Event of Default and (ii) no Material Adverse Effect has occurred and is continuing.

## **SECTION 5. REPRESENTATIONS AND WARRANTIES OF BORROWER**

Borrower represents and warrants that:

5.1 Corporate Status. Borrower is a corporation duly organized, legally existing and in good standing under the laws of the State of Delaware, and is duly qualified as a foreign corporation in all jurisdictions in which the nature of its business or location of its properties require such qualifications and where the failure to be qualified could reasonably be expected to have a Material Adverse Effect. Borrower's present name, former names (if any), owned and leased locations, place of formation, tax identification number, organizational identification number and other information are correctly set forth in Exhibit C, as may be updated by Borrower in a written notice (including any Compliance Certificate) provided to Lender after the Closing Date.

5.2 Collateral. Borrower owns its property, free of all Liens, except for Permitted Liens. Borrower has the corporate power and authority to grant to Lender a Lien in the Collateral as security for the Secured Obligations.

5.3 Consents. Borrower's execution, delivery and performance of the Notes, this Agreement and all other Loan Documents, and Borrower's execution of the Warrant, (i) have been duly authorized by all necessary corporate action of Borrower, (ii) will not result in the creation or imposition of any Lien upon the Collateral, other than Permitted

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Liens and the Liens created by this Agreement and the other Loan Documents, (iii) do not violate any provisions of Borrower's Certificate of Incorporation, bylaws, or any material law, regulation, order, injunction, judgment, decree or writ to which Borrower is subject and (iv) except as described on Schedule 5.3, do not violate any material contract or agreement or require the consent or approval of any other Person that has not been obtained. The individual or individuals executing the Loan Documents and the Warrant on behalf of the Borrower are duly authorized to do so.

5.4 Material Adverse Effect. No Material Adverse Effect has occurred and is continuing.

5.5 Actions Before Governmental Authorities. Except as described on Schedule 5.5, there are no actions, suits or proceedings at law or in equity by or before any governmental authority now pending or, to the knowledge of Borrower, threatened in writing against or affecting Borrower or its property as to which there is a reasonable likelihood of an adverse determination and which, if adversely determined, would reasonably be expected to, individually or in the aggregate, result in a Material Adverse Effect.

5.6 Laws; Agreements. Borrower is not in violation of any law, rule or regulation, or in default with respect to any judgment, writ, injunction or decree of any governmental authority, where such violation or default is reasonably expected to result in a Material Adverse Effect. Borrower is not in default in any manner under any provision of any agreement or instrument evidencing Indebtedness, or any other material agreement to which it is a party or by which it is bound, and which default would reasonably be expected to have a Material Adverse Effect.

5.7 Information Correct and Current. No report, Advance Request, financial statement, exhibit or schedule furnished, by or on behalf of Borrower to Lender in connection with any Loan Document or included therein or delivered pursuant thereto, when taken together with all such other reports, statements or other documents or writings, contains any material misstatement of fact or omits to state any material fact necessary to make the statements therein, in the light of the circumstances under which they are made, not misleading at the time such statement was made or deemed made. Additionally, any and all financial or business projections provided by Borrower to Lender shall be at the time delivered (i) provided in good faith and based on the most current data and information available to Borrower, and (ii) the most current of such projections provided to Borrower's Board of Directors.

5.8 Tax Matters. Except as described on Schedule 5.8, (a) Borrower has filed all material federal, state and local tax returns that it is required to file (or extensions thereof), (b) Borrower has duly paid or fully reserved (if required under GAAP) for all material taxes or installments thereof (including any interest or penalties) as and when due, which have or may become due pursuant to such returns, and (c) Borrower has paid or fully reserved for any material tax assessment received by Borrower for the three (3) years preceding the Closing Date, if any (including any taxes being contested in good faith and by appropriate proceedings).



5.9 Intellectual Property Claims. Except for Permitted Liens, Borrower is the sole owner of, or otherwise has the right to use, the Intellectual Property material to its business. Except as described on Schedule 5.9,(i) to Borrower's knowledge, each of the material issued Copyrights, Trademarks and Patents is valid and enforceable, (ii) no material Intellectual Property of Borrower has been judged by a decision of a court of competent jurisdiction, invalid or unenforceable, in whole or in part, and (iii) no claim has been made to Borrower in writing that any material Intellectual Property of Borrower violates the rights of any third party except to the extent such claim would not reasonably be expected to cause a Material Adverse Effect. Exhibit D is a true, correct and complete list of each of Borrower's Patents, registered Trademarks, registered Copyrights, and material agreements under which Borrower licenses Intellectual Property from third parties (shrink-wrap software licenses and click on license agreements, open source code and other licenses available to the public without customization shall not be considered a material License or agreement), together with application or registration numbers, as applicable, owned by Borrower or any Subsidiary, in each case as of the Closing Date. Borrower is not in material breach of, nor has Borrower failed to perform any material obligations under, any of the foregoing contracts, licenses or agreements and, to Borrower's knowledge, no third party to any such contract, license or agreement is in material breach thereof or has failed to perform any material obligations thereunder in each case which would reasonably be expected to have a Material Adverse Effect.

5.10 Intellectual Property. Except as described on Schedule 5.10, Borrower has, or in the case of any proposed business, will have, all material rights with respect to Intellectual Property necessary in the operation or conduct of Borrower's business as currently conducted and proposed to be conducted by Borrower. Without limiting the generality of the foregoing, other than in connection with Permitted Transfers, and in the case of material in-bound Licenses, except for restrictions that are unenforceable under Division 9 of the UCC and except as provided in the GSK Agreement, Borrower has the right, to the extent required to operate Borrower's business, to freely transfer, license or assign the Intellectual Property licensed pursuant to such material License without condition, restriction or payment of any kind (other than payments in the ordinary course of business) to any third party, Borrower owns or has the right to use, pursuant to valid licenses, all material software development tools, library functions, compilers and other third-party software and other items that are necessary for the design, development, promotion, sale, license, manufacture, import, export, use or distribution of Borrower Products that are currently being clinically developed, manufactured or sold by Borrower. For the avoidance of doubt, shrink-wrap licenses, click on license agreements, open source code and other licenses available to the public without customization shall not be considered a material License.

5.11 Borrower Products. Except as described on Schedule 5.11, no material Intellectual Property owned by Borrower or Borrower Product has been or is subject to any actual or, to the knowledge of Borrower, threatened (in writing) litigation, inter-party proceeding (including any proceeding in the United States Patent and Trademark Office or any corresponding foreign office or agency) or outstanding decree, order, judgment, settlement agreement or stipulation that restricts in any material respect Borrower's use,

transfer or licensing thereof or that may affect the validity, use or enforceability thereof. To Borrower's knowledge, there is no decree, order, judgment, agreement, stipulation, arbitral award or other provision entered into in connection with any litigation or proceeding that obligates Borrower to grant licenses or ownership interest in any future material Intellectual Property related to the operation or conduct of the business of Borrower or Borrower Products. Borrower has not received any written notice or claim challenging Borrower's ownership in any material Intellectual Property (or written notice of any claim challenging the ownership in any material licensed Intellectual Property of the owner thereof) or suggesting that any third party has any claim of legal or beneficial ownership with respect thereto. To Borrower's knowledge, neither Borrower's use of its material Intellectual Property nor the production and sale of Borrower Products infringes in any material respect the Intellectual Property or other rights of others.

5.12 Financial Accounts. Exhibit E, as may be updated by the Borrower in a written notice provided to Lender after the Closing Date, is a true, correct and complete list of (a) all banks and other financial institutions at which Borrower or any Subsidiary maintains Deposit Accounts and (b) all institutions at which Borrower or any Subsidiary maintains an account holding Investment Property, and such exhibit correctly identifies in all material respects the name, address and telephone number of each bank or other institution, the name in which the account is held, and the complete account number therefor.

5.13 Employee Loans. Except as permitted as a Permitted Investment, Borrower has no outstanding loans to any employee, officer or director of the Borrower nor has Borrower guaranteed the payment of any loan made to an employee, officer or director of the Borrower by a third party.

5.14 Capitalization and Subsidiaries. Borrower's capitalization as of the Closing Date is set forth on Schedule 5.14 annexed hereto. Borrower does not own any stock, partnership interest or other securities of any Person, except for Permitted Investments. Attached as Schedule 5.14, as may be updated by Borrower in a written notice provided after the Closing Date, is a true, correct and complete list of each Subsidiary.

## **SECTION 6. INSURANCE; INDEMNIFICATION**

6.1 Coverage. Borrower shall cause to be carried and maintained commercial general liability insurance, on an occurrence form, against risks customarily insured against in Borrower's line of business. Such risks shall include the risks of bodily injury, including death, property damage, personal injury, advertising injury, and contractual liability per the terms of the indemnification agreement found in Section 6.3. Borrower must maintain a minimum of \$2,000,000 of commercial general liability insurance (including umbrella coverage) for each occurrence. Borrower has and agrees to maintain a minimum of \$2,000,000 of directors and officers' insurance for each occurrence and \$5,000,000 in the aggregate. So long as there are any Secured Obligations outstanding, Borrower shall also cause to be carried and maintained insurance upon the Collateral, insuring against all risks of physical loss or damage howsoever caused, in an amount not less than the full replacement cost of the Collateral, provided that such insurance may be subject to standard exceptions and deductibles. Borrower shall also carry and maintain a fidelity insurance policy in an amount not less than \$100,000.

6.2 Certificates. Borrower shall deliver to Lender certificates of insurance that evidence Borrower's compliance with its insurance obligations in Section 6.1 and the obligations contained in this Section 6.2. Borrower's insurance certificate shall state Lender is an additional insured for commercial general liability, an additional insured and a loss payee for all risk property damage insurance, subject to the insurer's approval, a loss payee for fidelity insurance, and a loss payee for property insurance and additional insured for liability insurance for any future insurance that Borrower may acquire from such insurer. Attached to the certificates of insurance will be additional insured endorsements for liability and lender's loss payable endorsements for all risk property damage insurance and fidelity. All certificates of insurance will provide for a minimum of thirty (30) days advance written notice to Lender of cancellation (except for 10 days for non payment). Any failure of Lender to scrutinize such insurance certificates for compliance is not a waiver of any of Lender's rights, all of which are reserved.

6.3 Indemnity. Borrower agrees to indemnify and hold Lender and its officers, directors, employees, agents, in-house attorneys, representatives and shareholders harmless from and against any and all claims, costs, expenses, damages and liabilities (including such claims, costs, expenses, damages and liabilities based on liability in tort, including strict liability in tort), including reasonable attorneys' fees and disbursements and other costs of investigation or defense (including those incurred upon any appeal), that may be instituted or asserted against or incurred by Lender or any such Person as the result of credit having been extended, suspended or terminated under this Agreement and the other Loan Documents or the administration of such credit, or in connection with or arising out of the transactions contemplated hereunder and thereunder, or any actions or failures to act in connection therewith, or arising out of the disposition or utilization of the Collateral, excluding in all cases claims resulting from Lender's or any indemnitee's gross negligence or willful misconduct. Borrower agrees to pay, and to save Lender harmless from, any and all liabilities with respect to, or resulting from any delay in paying, any and all excise, sales or other similar taxes (excluding taxes imposed on or measured by the net income of Lender) that may be payable or determined to be payable with respect to any of the Collateral or this Agreement; provided, however, that (i) with respect to such liabilities imposed originally and independently on Lender, Lender shall notify a Borrower of any such liabilities within 180 days of the initial date Lender had actual knowledge of Lender's direct exposure to such liabilities, and (ii) with respect to all other such liabilities not described in subsection (i), Lender shall notify Borrower of any such liabilities within 180 days of the initial date Lender has actual knowledge of its direct exposure to such liabilities.

## **SECTION 7. COVENANTS OF BORROWER**

Borrower agrees as follows:

7.1 Financial Reports. Borrower shall furnish to Lender the financial statements and reports listed hereinafter (the "Financial Statements"):

(a) as soon as practicable (and in any event within 30 days) after the end of each month, unaudited interim and year-to-date financial statements as of the end of such month (prepared on a consolidated basis, if applicable), including balance sheet and related statements of income and cash flows, all certified on behalf of Borrower by Borrower's Chief Executive Officer, Chief Operating Officer or Chief Financial Officer to the effect that they have been prepared in accordance with GAAP, except (i) for the absence of footnotes, (ii) that they are subject to normal year end adjustments, (iii) they do not contain certain non-cash items, and (iv) that they are subject to adjustment with respect to revenue recognition for upfront and milestone payments.

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(b) as soon as practicable (and in any event within 45 days) after the end of each of the first three calendar quarters of each year (I) unaudited interim and year-to-date financial statements as of the end of such calendar quarter (prepared on a consolidated basis, if applicable), including balance sheet and related statements of income and cash flows, certified on behalf of Borrower by Borrower's Chief Executive Officer, Chief Operating Officer or Chief Financial Officer to the effect that they have been prepared in accordance with GAAP, except (i) for the absence of footnotes, (ii) that they are subject to normal year end adjustments, (iii) they do not contain certain non-cash items, and (iv) that they are subject to adjustment with respect to revenue recognition for upfront and milestone payments; and (II) before an Initial Public Offering, the most recent capitalization table for Borrower, including the weighted average exercise price of employee stock options.

(c) (I) as soon as practicable and in any event within sixty (60) days after the end of each fiscal year, preliminary financial statements as of the end of such fiscal year (prepared on a consolidated basis, if applicable), including balance sheet and related statements of income and cash flows, certified on behalf of Borrower by Borrower's Chief Executive Officer, Chief Operating Officer or Chief Financial Officer to the effect that they have been prepared in accordance with GAAP, except (i) for the absence of footnotes, (ii) that they are subject to normal year end adjustments, (iii) they do not contain certain non-cash items, and (iv) that they are subject to adjustment with respect to revenue recognition for upfront and milestone payments; (II) before an Initial Public Offering, as soon as practicable and in any event within sixty (60) days after the end of each fiscal year, the most recent capitalization table for Borrower, including the weighted average exercise price of employee stock options; and (III) as soon as practicable and in any event within one hundred eighty (180) days) after the end of each fiscal year, audited financial statements as of the end of such year (prepared on a consolidated basis, if applicable), including balance sheet and related statements of income and cash flows, and setting forth in comparative form the corresponding figures for the preceding fiscal year, certified by a firm of independent certified public accountants selected by Borrower and reasonably acceptable to Lender, accompanied by an audit report from such accountants which is unqualified as to scope of audit;

(d) as soon as practicable (and in any event within 30 days) after the end of each month, a Compliance Certificate in the form of Exhibit F;

(e) promptly after the sending or filing thereof, as the case may be, copies of any proxy statements, financial statements or reports that Borrower has made available generally to holders of its Preferred Stock and copies of any regular, periodic and special reports or registration statements that Borrower files with the Securities and Exchange Commission or any governmental authority that may be substituted therefor, or any national securities exchange;

(f) Before an Initial Public Offering, at the same time and in the same manner as it gives to its Board of Directors, copies of all notices, minutes, consents and other materials that Borrower provides to its Board of Directors in connection with meetings of the Board of Directors, and minutes of such meetings, provided Borrower may exclude from such delivery any materials, the disclosure of which would reasonably be expected to constitute or effect a waiver of the attorney-client privilege;

(g) financial and business projections promptly following their approval by Borrower's Board of Directors, as well as budgets, operating plans; and

(h) other financial information reasonably requested by Lender.

Borrower shall not make any change in its fiscal years or fiscal quarters or, without notice to Lender, any change in its accounting policies or reporting practices. The fiscal year of Borrower shall end on December 31.

The executed Compliance Certificate may be sent via facsimile to Lender at (650) 473-9194 or via e-mail to jbourque@herculestech.com. All Financial Statements required to be delivered pursuant to clauses (a), (b) and (c) shall be sent via e-mail to financialstatements@herculestech.com with a copy to jbourque@herculestech.com provided, that if e-mail is not available or sending such Financial Statements via e-mail is not possible, they shall be sent via facsimile to Lender at: (866) 468-8916, attention Chief Credit Officer.

7.2 Management Rights. Borrower shall permit any representative that Lender authorizes, including its attorneys and accountants, to inspect the Collateral and examine and make copies and abstracts of the books of account and records of Borrower at reasonable times and upon reasonable notice during normal business hours (but in any event no more than once in any 12-month period unless an Event of Default has occurred and is continuing). In addition, any such representative shall have the right to meet with management and officers of Borrower to discuss such books of account and records. In addition, Lender shall be entitled at reasonable times and intervals to consult with and advise the management and officers of Borrower concerning significant business issues affecting Borrower. Such consultations shall not unreasonably interfere with Borrower's business operations. The parties intend that the rights granted Lender shall constitute "management rights" within the meaning of 29 C.F.R Section 2510.3-101(d)(3)(ii), but that any advice, recommendations or participation by Lender with respect to any business issues shall not be deemed to give Lender, nor be deemed an exercise by Lender of, control over Borrower's management or policies.

7.3 Further Assurances. Borrower shall from time to time execute, deliver and file, alone or with Lender, any financing statements, security agreements, collateral assignments, notices, control agreements, or other necessary documents to perfect or give to Lender a first priority Lien on the Collateral (subject to Permitted Liens). Borrower shall from time to time procure any instruments or documents as may be reasonably requested by Lender, and take all further action that may be necessary or desirable, or that Lender may reasonably request, to perfect and protect the Liens granted hereby and thereby. In addition, and for such purposes only, Borrower hereby authorizes Lender to execute and deliver on behalf of Borrower and to file such financing statements, collateral assignments, notices, control agreements, security agreements and other documents without the signature of Borrower either in Lender's name or in the name of Lender as agent and attorney-in-fact for Borrower. Borrower shall in its reasonable business judgment protect and defend Borrower's title to the Collateral and Lender's Lien thereon against all Persons claiming any interest adverse to Borrower or Lender other than Permitted Liens.

7.4 Indebtedness. Borrower shall not create, incur, assume, guarantee or be or remain liable with respect to any Indebtedness, or permit any Subsidiary so to do, other than Permitted Indebtedness or prepay any Indebtedness or take any actions which impose on Borrower an obligation to prepay any Indebtedness at any time before the Maturity Date, except for the conversion of Indebtedness into equity securities and the payment of cash in lieu of fractional shares in connection with such conversion.

7.5 Encumbrances. Borrower shall at all times keep its property free and clear from any Liens whatsoever (except for Permitted Liens), and shall give Lender prompt written notice when the Borrower knows of any legal process affecting such property, or any Liens thereon. Borrower shall cause its Subsidiaries to protect and defend such Subsidiary's title to its property from and against all Persons claiming any interest adverse to such Subsidiary, and Borrower shall cause its Subsidiaries at all times to keep such Subsidiary's property free and clear from any Liens whatsoever (except for Permitted Liens), and shall give Lender prompt written notice when the Borrower knows of any legal process affecting such Subsidiary's property. Borrower shall not enter into any agreement with any Person other than Lender (other than in connection with Permitted Liens and Permitted Transfers) that has the effect of restricting Borrower from granting a Lien on its Intellectual Property to Lender.

7.6 Investments. Borrower shall not directly or indirectly acquire or own, or make any Investment in or to any Person, or permit any of its Subsidiaries so to do, other than Permitted Investments.

7.7 Distributions. Borrower shall not, and shall not allow any Subsidiary to, (a) repurchase or redeem any class of stock or other equity interest other than (i) pursuant to employee, director or consultant repurchase plans or other similar agreements, in an aggregate amount not to exceed \$250,000, or (ii) pursuant to Section 4 of the Third Amended and Restated Right of First Refusal and Co-Sale Agreement dated as of June 1, 2009 provided that any such repurchase is approved by the Borrower's Board of Directors, in an aggregate amount not to exceed \$500,000, (b) declare or pay any cash dividend or

make a cash distribution on any class of stock or other equity interest, except that a Subsidiary may pay dividends or make distributions to Borrower, or (c) lend money to any employees, officers or directors or guarantee the payment of any such loans granted by a third party other than Permitted Investments.

7.8 Transfers. Except for Permitted Transfers, Permitted Investments and Permitted Liens, Borrower shall not voluntarily or involuntarily transfer, sell, lease, license, lend or in any other manner convey any equitable, beneficial or legal interest in any material portion of their assets.

7.9 Mergers or Acquisitions. (a) Borrower shall not merge or consolidate, or permit any of its Subsidiaries to merge or consolidate, with or into any other business organization (other than mergers or consolidations of a Subsidiary into another Subsidiary or into Borrower), (b) Borrower shall not acquire, or permit any of its Subsidiaries to acquire, all or substantially all of the capital stock or property of another Person other than Permitted Investments. Borrower may dissolve any Subsidiary as long as the assets of that Subsidiary are promptly distributed to such Subsidiary's shareholder.

7.10 Taxes. Borrower and its Subsidiaries shall pay when due all material taxes, fees or other charges of any nature whatsoever (together with any related interest or penalties) now or hereafter imposed or assessed against Borrower, Lender or the Collateral or upon Borrower's ownership, possession, use, operation or disposition thereof or upon Borrower's rents, receipts or earnings arising therefrom. Borrower shall file on or before the due date therefor all personal property tax returns (or extensions) in respect of the Collateral. Notwithstanding the foregoing, Borrower may contest, in good faith and by appropriate proceedings, taxes for which Borrower maintains adequate reserves therefor in accordance with GAAP.

7.11 Corporate Changes.

(a) Neither Borrower nor any Subsidiary shall change its corporate name, legal form or jurisdiction of formation without twenty (20) days' prior written notice to Lender.

(b) The Borrower shall not suffer a Change in Control.

(c) Neither Borrower nor any Subsidiary shall relocate its chief executive office or its principal place of business unless: (i) it has provided prior written notice to Lender; and (ii) such relocation shall be within the continental United States.

(d) Neither Borrower nor any Subsidiary shall relocate any item of Collateral (other than (v) Borrower Products, including compounds and raw materials used to manufacture biopharmaceuticals or which are used for preclinical testing or clinical trials, in the ordinary course of business, (w) Permitted Transfers, (x) sales of Inventory in the ordinary course of business, (y) relocations of Equipment having an aggregate value of up to \$150,000 in any fiscal year, and (z) relocations of Collateral from a location described on Exhibit C to another location described on Exhibit C) unless (i) it has

provided prompt written notice to Lender, (ii) such relocation is within the continental United States and, (iii) if such relocation is to a third party bailee, and the Collateral has a value in excess of \$250,000, it has delivered a bailee agreement in form and substance reasonably acceptable to Lender.

7.12 Deposit Accounts. Neither Borrower nor any Subsidiary shall maintain any Deposit Accounts constituting Collateral (other than payroll accounts or accounts holding trust fund taxes), or accounts holding Investment Property constituting Collateral, except with respect to which Lender has an Account Control Agreement, if applicable.

7.13 Subsidiaries. Borrower shall notify Lender of each Subsidiary formed subsequent to the Closing Date and, within 15 days of formation, shall cause any such Subsidiary organized under the laws of any State within the United States to execute and deliver to Lender a Joinder Agreement.

## **SECTION 8. RESERVED**

8.1 Reserved.

## **SECTION 9. EVENTS OF DEFAULT**

The occurrence of any one or more of the following events shall be an Event of Default:

9.1 Payments. Borrower fails to pay any amount due under this Agreement, the Notes or any of the other Loan Documents on the due date, and in each case such default continues for more than 3 business days after the due date thereof; or

9.2 Covenants. Borrower breaches or defaults in the performance of any covenant under any of the Loan Documents, and (a) with respect to a default under any such covenant under this Agreement (other than under Sections 6.1, 7.5, 7.6, 7.7, 7.8, 7.9 or 7.11) such default continues for more than ten (10) business days after the earlier of the date on which (i) Lender has given notice of such default to Borrower and (ii) Borrower has actual knowledge of such default, or (b) with respect to a default under any of Sections 6.1, 7.5, 7.6, 7.7, 7.8 or 7.9, (b) the occurrence of such default, or (c) with respect to a default under any of Sections 7.9(a) and 7.11(b), the Lender has given notice of such default to Borrower no later than 30 days after a Change of Control; or

9.3 Material Adverse Effect. An event has occurred that would reasonably be expected to have a Material Adverse Effect; or

9.4 Other Loan Documents. The occurrence of any default under any Loan Document, the Warrant or any other agreement between Borrower and Lender and such default continues for more than ten business (10) days after the earlier of (a) Lender has given notice of such default to Borrower, or (b) Borrower has actual knowledge of such default; or



9.5 Representations. Any representation or warranty made by Borrower in any Loan Document or in the Warrant shall have been false or misleading in any material respect; or

9.6 Insolvency. Borrower (A) (i) shall make an assignment for the benefit of creditors; or (ii) shall be unable to pay its debts as they become due, or be unable to pay the Secured Obligations under the Loan Documents, or shall become insolvent; or (iii) shall file a voluntary petition in bankruptcy; or (iv) shall file any petition, answer, or document seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation pertinent to such circumstances; or (v) shall seek or consent to or acquiesce in the appointment of any trustee, receiver, or liquidator of Borrower or of all or any substantial part (i.e., 33-1/3% or more) of the assets or property of Borrower; or (vi) shall cease operations of its business as its business has normally been conducted for 3 consecutive business days, or terminate substantially all of its employees; or (vii) Borrower or its directors or majority shareholders shall take any action initiating any of the foregoing actions described in clauses (i) through (vi); or (B) either (i) sixty (60) days shall have expired after the commencement of an involuntary action against Borrower seeking reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation, without such action being dismissed or all orders or proceedings thereunder affecting the operations or the business of Borrower being stayed; or (ii) a stay of any such order or proceedings shall thereafter be set aside and the action setting it aside shall not be timely appealed; or (iii) Borrower shall file any answer admitting or not contesting the material allegations of a petition filed against Borrower in any such proceedings; or (iv) the court in which such proceedings are pending shall enter a decree or order granting the relief sought in any such proceedings; or (v) forty five (45) days shall have expired after the appointment, without the consent or acquiescence of Borrower, of any trustee, receiver or liquidator of Borrower or of all or any substantial part of the properties of Borrower without such appointment being vacated; or

9.7 Attachments; Judgments. Any portion of Borrower's assets having a value in excess of \$350,000 is attached or seized, or a levy is filed against any such assets, or a judgment or judgments (not covered by insurance as to which an insurer not affiliated with Borrower has acknowledged coverage) is/are entered for the payment of money, individually or in the aggregate, of at least \$350,000, and remains unstayed, unbonded and unsatisfied for more than 30 days, or Borrower is enjoined or in any way prevented by court order from conducting any material part of its business; or

9.8 Other Obligations. The occurrence of any default under any agreement or obligation of Borrower involving any Indebtedness in excess of \$175,000.

## **SECTION 10. REMEDIES**

10.1 General. Upon and during the continuance of any one or more Events of Default, (i) Lender may, at its option, accelerate and demand payment of all or any part of the Secured Obligations together with a Prepayment Charge and declare them to be immediately due and payable (provided, that upon the occurrence of an Event of Default of

the type described in Section 9.6, the Notes and all of the Secured Obligations shall automatically be accelerated and made due and payable, in each case without any further notice or act), and (ii) Lender may notify any of Borrower's account debtors to make payment directly to Lender, compromise the amount of any such account on Borrower's behalf and endorse Lender's name without recourse on any such payment for deposit directly to Lender's account. Lender may exercise all rights and remedies with respect to the Collateral under the Loan Documents or otherwise available to it under the UCC and other applicable law, including the right to release, hold, sell, lease, liquidate, collect, realize upon, or otherwise dispose of all or any part of the Collateral and the right to occupy, utilize, process and commingle the Collateral. All Lender's rights and remedies shall be cumulative and not exclusive.

10.2 Collection; Foreclosure. Upon the occurrence and during the continuance of any Event of Default, Lender may, at any time or from time to time, apply, collect, liquidate, sell in one or more sales, lease or otherwise dispose of, any or all of the Collateral, in its then condition or following any commercially reasonable preparation or processing, in such order as Lender may elect. Any such sale may be made either at public or private sale at its place of business or elsewhere. Borrower agrees that any such public or private sale may occur upon ten (10) calendar days' prior written notice to Borrower. Lender may require Borrower to assemble the Collateral and make it available to Lender at a place designated by Lender that is reasonably convenient to Lender and Borrower. The proceeds of any sale, disposition or other realization upon all or any part of the Collateral shall be applied by Lender in the following order of priorities:

First, to Lender in an amount sufficient to pay in full Lender's costs and professionals' and advisors' fees and expenses as described in Section 11.11;

Second, to Lender in an amount equal to the then unpaid amount of the Secured Obligations (including principal, interest, and the Default Rate interest), in such order and priority as Lender may choose in its sole discretion; and

Finally, after the full and final payment in Cash of all of the Secured Obligations, to any creditor holding a junior Lien on the Collateral, or to Borrower or its representatives or as a court of competent jurisdiction may direct.

Lender shall be deemed to have acted reasonably in the custody, preservation and disposition of any of the Collateral if it complies with the obligations of a secured party under the UCC.

10.3 The Lender agrees not to issue a notice of exclusive control or any other instruction under any Account Control Agreement unless an Event of Default has occurred and is continuing.

10.4 No Waiver. Lender shall be under no obligation to marshal any of the Collateral for the benefit of Borrower or any other Person, and Borrower expressly waives all rights, if any, to require Lender to marshal any Collateral.

10.5 Cumulative Remedies. The rights, powers and remedies of Lender hereunder shall be in addition to all rights, powers and remedies given by statute or rule of

law and are cumulative. The exercise of any one or more of the rights, powers and remedies provided herein shall not be construed as a waiver of or election of remedies with respect to any other rights, powers and remedies of Lender.

#### **SECTION 11. MISCELLANEOUS**

11.1 Severability. Whenever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement shall be prohibited by or invalid under such law, such provision shall be ineffective only to the extent and duration of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

11.2 Notice. Except as otherwise provided herein, any notice, demand, request, consent, approval, declaration, service of process or other communication (including the delivery of Financial Statements) (a "Notification") that is required, contemplated, or permitted under the Loan Documents or with respect to the subject matter hereof shall be in writing, and shall be deemed to have been validly served, given, delivered, and received upon the earlier of: (i) the day of transmission by facsimile or hand delivery or delivery by an overnight express service or overnight mail delivery service; or (ii) the third calendar day after deposit in the United States mails, with proper first class postage prepaid, in each case addressed to the party to be notified as follows:

(a) If to Lender:

**HERCULES TECHNOLOGY GROWTH CAPITAL, INC.**  
Legal Department  
Attention: Chief Legal Officer and Janice Bourque  
400 Hamilton Avenue, Suite 310  
Palo Alto, CA 94301  
Facsimile: 650-473-9194  
Telephone: 650-289-3060

With a copy to:

**HERCULES TECHNOLOGY GROWTH CAPITAL, INC.**  
31 St. James Ave., Suite 790  
Boston, MA 02116  
Attention: Janice Bourque  
Facsimile: 617-  
Telephone: 617-314-9992

(b) If to Borrower:

**CONCERT PHARMACEUTICALS, INC.**  
99 Hayden Ave., Suite 500  
Lexington, MA 02421  
Attention: Nancy Stuart  
Chief Operating Officer  
Facsimile:  
Telephone:

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With a copy (that shall not constitute notice) to:

Wilmer Cutler Pickering Hale and Dorr LLP.

60 State Street

Boston, MA 02446

Attention: David E. Redlick

Facsimile: 617-526-5000

Telephone: 617-526-6000

or to such other address as each party may designate for itself by like notice. Any notification delivered to a party to this Agreement in accordance with this Section shall be valid notwithstanding any failure to deliver a copy thereof to a Person not party to this Agreement.

11.3 Entire Agreement; Amendments. This Agreement, the Notes, and the other Loan Documents constitute the entire agreement and understanding of the parties hereto in respect of the subject matter hereof and thereof, and supersede and replace in their entirety any prior proposals, term sheets, letters, negotiations or other documents or agreements, whether written or oral, with respect to the subject matter hereof or thereof (including Lender's revised proposal letter dated October 12, 2011). None of the terms of this Agreement, the Notes or any of the other Loan Documents may be amended except by an instrument executed by each of the parties hereto.

11.4 No Strict Construction. The parties hereto have participated jointly in the negotiation and drafting of this Agreement. In the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as if drafted jointly by the parties hereto and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of the authorship of any provisions of this Agreement.

11.5 No Waiver. The powers conferred upon Lender by this Agreement are solely to protect its rights hereunder and under the other Loan Documents and its interest in the Collateral and shall not impose any duty upon Lender to exercise any such powers. No omission or delay by Lender at any time to enforce any right or remedy reserved to it, or to require performance of any of the terms, covenants or provisions hereof by Borrower at any time designated, shall be a waiver of any such right or remedy to which Lender is entitled, nor shall it in any way affect the right of Lender to enforce such provisions thereafter.

11.6 Survival. All agreements, representations and warranties contained in this Agreement, the Notes and the other Loan Documents or in any document delivered pursuant hereto or thereto shall be for the benefit of Lender and shall survive the execution and delivery of this Agreement and Section 6.3 and any provisions that, by their express terms are to survive the expiration or other termination of this Agreement shall survive such expiration or termination.

11.7 Successors and Assigns. The provisions of this Agreement and the other Loan Documents shall inure to the benefit of and be binding on Borrower and its permitted assigns (if any). Borrower shall not assign its obligations under this Agreement, the Notes or any of the other Loan Documents without Lender's express prior written consent, and any such attempted assignment shall be void and of no effect. Lender may assign, transfer, or endorse its rights hereunder and under the other Loan Documents to an Assignee (defined in Section 11.13) without prior notice to Borrower or Borrower's consent, and all of such rights shall inure to the benefit of Lender's successors and assigns.

11.8 Governing Law. This Agreement, the Notes and the other Loan Documents have been negotiated and delivered to Lender in the Commonwealth of Massachusetts, and shall have been accepted by Lender in the Commonwealth of Massachusetts. Payment to Lender by Borrower of the Secured Obligations is due in the Commonwealth of Massachusetts. This Agreement, the Notes and the other Loan Documents shall be governed by, and construed and enforced in accordance with, the laws of the Commonwealth of Massachusetts, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

11.9 Consent to Jurisdiction and Venue. All judicial proceedings (to the extent that the reference requirement of Section 11.10 is not applicable) arising in or under or related to this Agreement, the Notes or any of the other Loan Documents may be brought in any state or federal court located in the Commonwealth of Massachusetts. By execution and delivery of this Agreement, each party hereto generally and unconditionally: (a) consents to exclusive personal jurisdiction in Suffolk County, Commonwealth of Massachusetts; (b) waives any objection as to jurisdiction or venue in the Business Litigation Session of the Suffolk Superior Court, Suffolk County, Commonwealth of Massachusetts; (c) agrees not to assert any defense based on lack of jurisdiction or venue in the aforesaid courts; and (d) irrevocably agrees to be bound by any judgment rendered thereby in connection with this Agreement, the Notes or the other Loan Documents. Service of process on any party hereto in any action arising out of or relating to this Agreement shall be effective if given in accordance with the requirements for notice set forth in Section 11.2, and shall be deemed effective and received as set forth in Section 11.2. Nothing herein shall affect the right to serve process in any other manner permitted by law or shall limit the right of either party to bring proceedings in the courts of any other jurisdiction.

11.10 Mutual Waiver of Jury Trial / Judicial Reference.

(a) Because disputes arising in connection with complex financial transactions are most quickly and economically resolved by an experienced and expert person and the parties wish applicable state and federal laws to apply (rather than arbitration rules), the parties desire that their disputes be resolved by a judge applying such applicable laws. **EACH OF BORROWER AND LENDER SPECIFICALLY WAIVES ANY RIGHT IT MAY HAVE TO TRIAL BY JURY OF ANY CAUSE OF ACTION, CLAIM, CROSS-CLAIM,**

COUNTERCLAIM, THIRD PARTY CLAIM OR ANY OTHER CLAIM (COLLECTIVELY, "CLAIMS") ASSERTED BY BORROWER AGAINST LENDER OR ITS ASSIGNEE OR BY LENDER OR ITS ASSIGNEE AGAINST BORROWER. This waiver extends to all such Claims, including Claims that involve Persons other than Borrower and Lender; Claims that arise out of or are in any way connected to the relationship between Borrower and Lender; and any Claims for damages, breach of contract, tort, specific performance, or any equitable or legal relief of any kind, arising out of this Agreement, any other Loan Document.

11.11 Professional Fees. Borrower promises to pay Lender's fees and expenses necessary to finalize the loan documentation, including but not limited to reasonable attorneys fees, UCC searches, filing costs, and other reasonable miscellaneous expenses. In addition, Borrower promises to pay any and all reasonable attorneys' and other reasonable professionals' fees and expenses incurred by Lender after the Closing Date in connection with or related to: (a) the Loan; (b) the administration, collection, or enforcement of the Loan; (c) the amendment or modification of the Loan Documents; (d) any waiver, consent, release, or termination under the Loan Documents; (e) the protection, preservation, sale, lease, liquidation, or disposition of Collateral or the exercise of remedies with respect to the Collateral; (f) any legal, litigation, administrative, arbitration, or out of court proceeding in connection with or related to Borrower or the Collateral, and any appeal or review thereof; and (g) any bankruptcy, restructuring, reorganization, assignment for the benefit of creditors, workout, foreclosure, or other action related to Borrower, the Collateral, the Loan Documents, including representing Lender in any adversary proceeding or contested matter commenced or continued by or on behalf of Borrower's estate, and any appeal or review thereof.

11.12 Confidentiality. Lender acknowledges that certain items of Collateral and information provided to Lender by Borrower are confidential or proprietary information of Borrower, if and to the extent such information either (x) is marked as confidential, proprietary or secret by Borrower at the time of disclosure, or (y) should reasonably be understood to be confidential, proprietary or secret (the "Confidential Information"). Accordingly, Lender agrees that any Confidential Information it may obtain in the course of acquiring, administering, perfecting or enforcing Lender's security interest in the Collateral or otherwise shall not be disclosed to any other person or entity in any manner whatsoever, in whole or in part, without the prior written consent of Borrower, except that Lender may disclose any such information: (a) to its own directors, officers, employees, accountants, counsel and other professional advisors and to its controlled affiliates if Lender in its sole discretion determines that any such party should have access to such information in connection with such party's responsibilities in connection with the Loan or this Agreement and, provided that such recipient of such Confidential Information either (i) agrees to be bound by the confidentiality provisions of this paragraph or (ii) is otherwise subject to confidentiality restrictions that reasonably protect against the disclosure of Confidential Information; (b) if such information is generally available to the public without any disclosure by Lender or breach of this Section 11.12; (c) if required or appropriate in any report, statement or testimony submitted to any governmental authority having or claiming to have jurisdiction over Lender; (d) if required or appropriate in

response to any summons or subpoena or in connection with any litigation, to the extent permitted or deemed advisable by Lender's counsel; (e) to comply with any legal requirement or law applicable to Lender; (f) to the extent reasonably necessary in connection with the exercise of any right or remedy under any Loan Document, including Lender's sale, lease, or other disposition of Collateral during the continuation of an Event of Default; (g) to any participant or assignee of Lender or any prospective participant or assignee; provided, that such participant or assignee or prospective participant or assignee agrees in writing to be bound by this Section prior to disclosure; or (h) otherwise with the prior written consent of Borrower; provided, that any disclosure made in violation of this Agreement shall not affect the obligations of Borrower or any of its affiliates or any guarantor under this Agreement or the other Loan Documents.

11.13 Assignment of Rights. Borrower acknowledges and understands that Lender may sell and assign all or part of its interest hereunder and under the Note(s) and Loan Documents (an "Assignment") to any person or entity provided that (a) no such Assignment shall be made to a competitor of the Borrower, and (b) Lender will not make any Assignment to a Person organized or resident outside the United States without Borrower's consent which shall not be unreasonably withheld (such assignee, an "Assignee" or "assignee"). After such assignment the term "Lender" as used in the Loan Documents shall mean and include such Assignee, and such Assignee shall be vested with all rights, powers and remedies of Lender hereunder with respect to the interest so assigned; but with respect to any such interest not so transferred, Lender shall retain all rights, powers and remedies hereby given. No such assignment by Lender shall relieve Borrower of any of its obligations hereunder. No such Assignment shall release the Lender from its obligations to fund the Term Advance subject to the terms and conditions contained in Section 2.1 hereof. Lender agrees that in the event of any transfer by it of the Note(s), it will endorse thereon a notation as to the portion of the principal of the Note(s), which shall have been paid at the time of such transfer and as to the date to which interest shall have been last paid thereon.

11.14 Revival of Secured Obligations. This Agreement and the Loan Documents shall remain in full force and effect and continue to be effective if any petition is filed by or against Borrower for liquidation or reorganization, if Borrower becomes insolvent or makes an assignment for the benefit of creditors, if a receiver or trustee is appointed for all or any significant part of Borrower's assets, or if any payment or transfer of Collateral is recovered from Lender. The Loan Documents and the Secured Obligations and Collateral security shall continue to be effective, or shall be revived or reinstated, as the case may be, if at any time payment and performance of the Secured Obligations or any transfer of Collateral to Lender, or any part thereof is rescinded, avoided or avoidable, reduced in amount, or must otherwise be restored or returned by, or is recovered from, Lender or by any obligee of the Secured Obligations, whether as a "voidable preference," "fraudulent conveyance," or otherwise, all as though such payment, performance, or transfer of Collateral had not been made. In the event that any payment, or any part thereof, is rescinded, reduced, avoided, avoidable, restored, returned, or recovered, the Loan Documents and the Secured Obligations shall be deemed, without any further action or documentation, to have been revived and reinstated except to the extent of the full, final, and indefeasible payment to Lender in Cash.

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11.15 Counterparts. This Agreement and any amendments, waivers, consents or supplements hereto may be executed in any number of counterparts, and by different parties hereto in separate counterparts, each of which when so delivered shall be deemed an original, but all of which counterparts shall constitute but one and the same instrument.

11.16 No Third Party Beneficiaries. No provisions of the Loan Documents are intended, nor will be interpreted, to provide or create any third-party beneficiary rights or any other rights of any kind in any person other than Lender and Borrower unless specifically provided otherwise herein, and, except as otherwise so provided, all provisions of the Loan Documents will be personal and solely between the Lender and the Borrower.

11.17 Publicity. Subject to applicable law, Lender may use Borrower's name and logo, and include a brief description of the relationship between Borrower and Lender, in Lender's marketing materials, provided that the Borrower shall have the right to review such use prior to publication.

(SIGNATURES TO FOLLOW)



IN WITNESS WHEREOF, Borrower and Lender have duly executed and delivered this Loan and Security Agreement as of the day and year first above written.

**BORROWER:**

**CONCERT PHARMACEUTICALS, INC.**

Signature: /s/ Roger D. Tung

Print Name: Roger D. Tung

Title: Chief Executive Officer

Accepted in Boston, Massachusetts:

**LENDER:**

**HERCULES TECHNOLOGY GROWTH CAPITAL,  
INC.**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Its: \_\_\_\_\_

IN WITNESS WHEREOF, Borrower and Lender have duly executed and delivered this Loan and Security Agreement as of the day and year first above written.

**BORROWER:**

**CONCERT PHARMACEUTICALS, INC.**

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Accepted in Boston, Massachusetts:

**LENDER:**

**HERCULES TECHNOLOGY GROWTH CAPITAL,  
INC.**

By: /s/ K. Nicholas Martitsch

Name: K. Nicholas Martitsch

Its: Associate General Counsel

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Table of Exhibits and Schedules

Exhibit A:	Advance Request Attachment to Advance Request
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**EXHIBIT A**  
**ADVANCE REQUEST**

To:

Date: \_\_\_\_\_, 201

Hercules Technology Growth Capital, Inc.  
400 Hamilton Avenue, Suite 310  
Palo Alto, CA 94301  
Facsimile: 650-473-9194  
Attn: Janice Bourque

**CONCERT PHARMACEUTICALS, INC.** (“Borrower”) hereby requests from Hercules Technology Growth Capital, Inc. (“Lender”) an Advance in the amount of \_\_\_\_\_ Dollars (\$) on \_\_\_\_\_, \_\_\_\_\_ (the “Advance Date”) pursuant to the Loan and Security Agreement between Borrower and Lender (the “Agreement”). Capitalized words and other terms used but not otherwise defined herein are used with the same meanings as defined in the Agreement.

Please:

- (a) Issue a check payable to Borrower \_\_\_\_\_  
or
- (b) Wire Funds to Borrower’s account \_\_\_\_\_
- Bank: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_
- ABA Number: \_\_\_\_\_  
Account Number: \_\_\_\_\_  
Account Name: \_\_\_\_\_

Borrower represents that the conditions precedent to the Advance set forth in the Agreement are satisfied and shall be satisfied upon the making of such Advance, including but not limited to: (i) that no Material Adverse Effect has occurred and is continuing; (ii) No Material Adverse Effect has occurred and is continuing; (iii) that the representations and warranties set forth in the Agreement are true and correct in all material respects on and as of the Advance Date with the same effect as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date; (iv) that Borrower is in compliance in all material respects with all the terms and provisions set forth in each Loan Document on its part to be observed or performed; and (v) that as of the Advance Date, no fact or condition exists that constitutes (or would, with the passage of time, the giving of notice, or both) constitute an Event of Default under the Loan Documents. Borrower understands and acknowledges that Lender has the right to review the financial information supporting this representation and, based upon such review in its sole discretion, Lender may decline to fund the requested Advance if such representation is not true and correct in all material respects.

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Borrower hereby represents that the information described in Exhibit C to the Loan Agreement have not changed since the date of the Agreement or, if the Attachment to this Advance Request is completed, are as set forth in the Attachment to this Advance Request.

Borrower agrees to notify Lender promptly before the funding of the Loan if any of the matters which have been represented above shall not be true and correct on the Borrowing Date and if Lender has received no such notice before the Advance Date then the statements set forth above shall be deemed to have been made and shall be deemed to be true and correct as of the Advance Date.

Executed as of \_\_\_\_\_, 201 .

**BORROWER:**

**CONCERT PHARMACEUTICALS, INC.**

SIGNATURE: \_\_\_\_\_

TITLE: \_\_\_\_\_

PRINT NAME: \_\_\_\_\_

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**ATTACHMENT TO ADVANCE REQUEST**

Dated:

Borrower hereby represents and warrants to Lender that Borrower's current name and organizational status is as follows:

Name: **CONCERT PHARMACEUTICALS, INC.**  
Type of organization: Corporation  
State of organization: Delaware  
Organization file number: 4141420

Borrower hereby represents and warrants to Lender that the street addresses, cities, states and postal codes of its current owned and leased locations are as follows:

**EXHIBIT B-1**

**SECURED TERM PROMISSORY NOTE**

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Advance Date: \_\_\_\_\_, 201

Maturity Date: July 1, 2015

FOR VALUE RECEIVED, **CONCERT PHARMACEUTICALS, INC.**, a Delaware corporation (the "Borrower") hereby promises to pay to the order of Hercules Technology Growth Capital, Inc. or the holder of this Note (the "Lender") at 400 Hamilton Avenue, Suite 310, Palo Alto, CA 94301 or such other place of payment as the holder of this Secured Term Promissory Note (this "Promissory Note") may specify from time to time in writing, in lawful money of the United States of America, the principal amount of (\$ \_\_\_\_\_) or such other principal amount as Lender has advanced to Borrower, together with interest at a floating rate equal to the greater of (a) 8.50% per annum and (b) 8.50% plus the United States Prime Rate as reported in The Wall Street Journal minus 5.25%, not in any case to exceed 11.0% per annum, based upon a year consisting of 360 days, with interest computed daily based on the actual number of days in each month.

This Promissory Note is the Note referred to in, and is executed and delivered in connection with, that certain Loan and Security Agreement dated December \_\_\_\_\_, 2011, by and between Borrower and Lender (as the same may from time to time be amended, modified or supplemented in accordance with its terms, the "Loan Agreement"), and is entitled to the benefit and security of the Loan Agreement and the other Loan Documents (as defined in the Loan Agreement), to which reference is made for a statement of all of the terms and conditions thereof. All payments shall be made in accordance with the Loan Agreement. All terms defined in the Loan Agreement shall have the same definitions when used herein, unless otherwise defined herein. An Event of Default under the Loan Agreement shall constitute a default under this Promissory Note.

Borrower waives presentment and demand for payment, notice of dishonor, protest and notice of protest under the UCC or any applicable law. Borrower agrees to make all payments under this Promissory Note without setoff, recoupment or deduction and regardless of any counterclaim or defense. This Promissory Note has been negotiated and delivered to Lender and is payable in the Commonwealth of Massachusetts. This Promissory Note shall be governed by and construed and enforced in accordance with, the laws of the Commonwealth of Massachusetts, excluding any conflicts of law rules or principles that would cause the application of the laws of any other jurisdiction.

**BORROWER:**

**CONCERT PHARMACEUTICALS, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

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**EXHIBIT C**

**NAME, LOCATIONS, AND OTHER INFORMATION FOR BORROWER**

1. Borrower represents and warrants to Lender that Borrower's current name and organizational status as of the Closing Date is as follows:

Name: **CONCERT PHARMACEUTICALS, INC.**  
Type of organization: Corporation  
State of organization: Delaware  
Organization file number: 4141420

2. Borrower represents and warrants to Lender that for five (5) years prior to the Closing Date, Borrower did not do business under any other name or organization or form except the following:

Name: Concert Pharmaceuticals, Inc.  
Used during dates of: Five (5) years prior to the Closing  
Type of Organization: Corporation  
State of organization: Delaware  
Organization file Number: 4141420  
Borrower's fiscal year ends on: December 31  
Borrower's federal employer tax identification number is: 20-4839882

3. Borrower represents and warrants to Lender that its chief executive office is located at 99 Hayden Avenue, Suite 400 & 500, Lexington, MA 02421.



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**EXHIBIT D**

**BORROWER'S PATENTS, TRADEMARKS, COPYRIGHTS AND LICENSES**

See attached.

	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
1	<u>4-Hydroxybutyric Acid Analogs</u>		
	United States of America	61/442451	February 14, 2011
	United States of America	61/484296	May 10, 2011
	Canada	2740247	May 13, 2011
	Australia	2011200745	February 22, 2011
	Canada	2732479	February 23, 2011
	Australia	2011202741	June 8, 2011
2	<u>4-Hydroxybutyric Acid Analogs</u>		
	Patent Cooperation Treaty	PCT/US2010/031981	April 22, 2010
	Australia	2010239244	October 23, 2011
	European Patent Convention	10716196	October 23, 2011
	United States of America	13/265609	October 23, 2011
	Canada	NEW APPLICATION	October 23, 2011
	India	8456/DELNP/2011	October 23, 2011
3	<u>Alpha 1A-adrenoceptor antagonists</u>		
	United States of America	12/072,501	February 26, 2008
	United States of America	12/550864	February 26, 2008
	United States of America	13/189080	July 22, 2011
	Patent Cooperation Treaty	PCT/US2008/002513	February 26, 2008
	European Patent Convention	8726096.4	February 26, 2008
4	<u>Analogues of cilostazol</u>		
	United States of America	12/150107	April 24, 2008
	United States of America	12/644758	December 22, 2009
	Patent Cooperation Treaty	PCT/US2008/005301	April 24, 2008
	European Patent Convention	8743256.3	April 24, 2008
5	<u>Carbamoylpyridone derivatives</u>		
	United States of America	61/481977	May 3, 2011
6	<u>Derivatives of dimethylcurcumin</u>		
	United States of America	13/049481	March 16, 2011
	Patent Cooperation Treaty	PCT/US2011/028631	March 16, 2011
7	<u>Deuterated 2-amino-3-hydroxypropanoic acid derivatives</u>		
	United States of America	13/119318	March 16, 2011
	Patent Cooperation Treaty	PCT/US2009/057001	September 15, 2009
	European Patent Convention	9792561.4	September 15, 2009
8	<u>Deuterated Benzo[D][1,3]-dioxol derivatives</u>		
	United States of America	12/688466	January 15, 2010

	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
9	<u>Deuterated CFTR potentiators</u> United States of America	61/487497	May 18, 2011
10	<u>Deuterated fingolimod</u> United States of America Patent Cooperation Treaty European Patent Convention Hong Kong Japan United States of America	12/290645 PCT/US2008/012390 8847117.2 11101551.6 2010-532064 13/311171	October 31, 2008 October 31, 2008 October 31, 2008 October 31, 2008 October 31, 2008 05-Dec-2011
11	<u>Deuterated isoindoline-1,3-dione derivatives as PDE4 and TNF-alpha inhibitors</u> Patent Cooperation Treaty Australia Brazil Canada China (People's Republic) Eurasian Patent Organization European Patent Convention India Japan Korea, Republic of	PCT/US2010/038577 instructions to file sent instructions to file sent instructions to file sent 201010620532.7 instructions to file sent instructions to file sent instructions to file sent instructions to file sent instructions to file sent 10-2010-0132933	June 15, 2010 December 6, 2011 December 6, 2011 December 6, 2011 December 22, 2010 December 6, 2011 December 6, 2011 December 6, 2011 December 6, 2011 December 6, 2011 December 22, 2010
12	<u>Substituted isoindoline-1,3-dione derivatives</u> United States of America Korea, Republic of China (People's Republic)	12/816295 10-2010-0132933 2.01011E+11	June 15, 2010 December 22, 2010 December 22, 2010
13	<u>Deuterated pyridinones</u> United States of America Patent Cooperation Treaty	13/132784 PCT/US2009/066606	December 3, 2009 December 3, 2009
14	<u>Fluorinated diaryl urea derivatives</u> United States of America Patent Cooperation Treaty	13/320646 PCT/US2010/035655	15-Nov-2011 May 20, 2010
15	<u>Fluorouracil derivatives</u> Patent Cooperation Treaty	PCT/US2011/026436	February 28, 2011
16	<u>Method of utilizing recycled deuterium oxide in the synthesis of deuterated compounds</u> Patent Cooperation Treaty	PCT/US2011/050134	September 1, 2011

Title	Application Number	Filing Date
17 <u>Niacin prodrugs and deuterated versions thereof</u>	United States of America Patent Cooperation Treaty 12/948484 PCT/US2010/057051	November 17, 2010 November 17, 2010
18 <u>Novel benzo[D][1,3]-dioxol derivatives</u>	Patent Cooperation Treaty Australia Brazil Canada China (People's Republic) Eurasian Patent Organization European Patent Convention Hong Kong India Japan Korea, Republic of Mexico Philippines South Africa United States of America PCT/US2006/029599 2006275595 PI0615973-7 2616383 2.0068E+11 200800490 6813250.5 8111437 607/DELNP/2008 2008-524227 10-2008-7004867 MX/a/2008/001193 1-2008-500121 2008/00785 11/704554	July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 July 28, 2006 February 8, 2007
19 <u>Novel tetrahydro-1H-pyridof[4,3-B]indoles</u>	United States of America Patent Cooperation Treaty 12/625059 PCT/US2009/065872	November 24, 2009 November 25, 2009
20 <u>Oxazolidinone derivatives and methods of use</u>	United States of America Patent Cooperation Treaty Hong Kong Japan 12/214260 PCT/US2007/022516 10102539.2 2009-533406	June 17, 2008 October 23, 2007 October 23, 2007 October 23, 2007
21 <u>Polymorphs of (S)-1-(4,4,6,6,6-pentadeutero-5-hydroxyhexyl)-3,7-dimethyl-1H-purine-2,6(3H,7H)-dione</u>	Patent Cooperation Treaty PCT/US2011/050229	September 1, 2011
22 <u>Process for preparing an enantiomerically enriched, deuterated secondary alcohol from a corresponding ketone without reducing deuterium incorporation</u>	Patent Cooperation Treaty PCT/US2011/050138	September 1, 2011

	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
23	<u>Process for preparing an enantiomerically enriched, deuterated secondary alcohol from a corresponding ketone without reducing deuterium incorporation</u> Patent Cooperation Treaty	PCT/US2011/050139	September 1, 2011
24	<u>Prostacyclin analogs</u> Patent Cooperation Treaty United States of America	PCT/US2009/003801 13/001543	June 26, 2009 March 31, 2011
25	<u>Prostacyclin analogs</u> Patent Cooperation Treaty United States of America United States of America Japan Australia Brazil Canada China (People's Republic) Eurasian Patent Organization European Patent Convention India Korea, Republic of Mexico South Africa	PCT/US2007/026264 12/520493 12/489425 2009-542961 2007338701 PI0719463-3 2672904 2.0078E+11 200900862 7863238.7 4730/DELNP/2009 10-2009-7015336 MX/a/2009/006692 2009/04722	December 21, 2007 December 21, 2007 June 22, 2009 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007 December 21, 2007
26	<u>Prostacyclin analogs</u> Patent Cooperation Treaty	PCT/US2010/040891	July 2, 2010
27	<u>Pyrazinoisoquinoline compounds</u> United States of America	61/449312	March 4, 2011
28	<u>Pyrazinoisoquinoline compounds</u> United States of America United States of America Patent Cooperation Treaty African Union Territories (OAPI) Brazil European Patent Convention India African Regional Industrial Property Organization	61/210279 13/256787 PCT/US2010/027476 NEW APPLICATION NEW APPLICATION 10709147.2 7022/DELNP/2011 AP/P/2011/005932	March 17, 2009 September 15, 2011 March 16, 2010 September 15, 2011 September 19, 2011 October 14, 2011 September 14, 2011
29	<u>Pyridineamine derivatives</u> United States of America Patent Cooperation Treaty	13/120455 PCT/US2009/058212	August 26, 2011 September 24, 2009



Title	Application Number	Filing Date
37 <u>Pharmaceutically acceptable salt of a substituted oxo(or hydroxy)hexyl-1H-purine-2,6(3H,7H)-dione compound</u> Pakistan	390/2010	August 25, 2009
38 <u>Substituted xanthine derivatives</u> United States of America Patent Cooperation Treaty	12/874049 PCT/US2010/047574	September 1, 2010 September 1, 2010
39 <u>Substituted xanthine derivatives</u> United States of America United States of America Patent Cooperation Treaty	12/873991 12/874783 PCT/US2010/047708	September 1, 2010 September 2, 2010 September 2, 2010
40 <u>Substituted xanthine derivatives</u> Hong Kong Philippines Japan European Patent Convention	11104593 1-2010-501961 2010-548747 9714926.4	May 9, 2011 February 27, 2009 February 27, 2009 February 27, 2009
41 <u>Substituted xanthine derivatives</u> United States of America	61/509343	July 19, 2011
42 <u>Synthesis of deuterated catechols and benzo[D][1,3]dioxoles and derivatives thereof</u> Patent Cooperation Treaty Australia Canada China (People's Republic) European Patent Convention Hong Kong India Japan Mexico United States of America	PCT/US2008/010643 2008299921 2698808 2.0088E+11 8830527.1 10112245.6 2015/DELNP/2010 2010-524866 MX/a/2010/002692 12/283621	September 12, 2008 September 12, 2008 September 12, 2008 September 12, 2008 September 12, 2008 December 30, 2010 September 12, 2008 September 12, 2008 September 12, 2008 September 12, 2008
43 <u>Synthesis of deuterated morpholine derivatives</u> United States of America Patent Cooperation Treaty	12/456507 PCT/US2009/003628	June 17, 2009 June 17, 2009

	Title	Application Number	Filing Date
44	<u>Substituted dioxopiperidinyl phthalimide derivatives</u>		
	United States of America	13/107873	May 13, 2011
	Patent Cooperation Treaty	PCT/US2011/045629	July 27, 2011
	Patent Cooperation Treaty	PCT/US2009/006105	November 13, 2009
	Australia	2009314568	May 17, 2011
	Brazil	PI0915267-9	May 12, 2011
	Canada	2743902	May 13, 2011
	China (People's Republic)	2.0098E+11	November 13, 2009
	Eurasian Patent Organization	201100750	June 10, 2011
	European Patent Convention	9826438.5	June 9, 2011
	India	1038/MUMNP/2011	May 23, 2011
	Japan	2011-536328	May 13, 2011
	Korea, Republic of	10-2011-7013575	June 14, 2011
	Mexico	MX/a/2011/005112	May 13, 2011
	Philippines	1-2011-500901	November 13, 2009
	South Africa	2011/04361	June 10, 2011
45	<u>Azapeptide derivatives</u>		
	Patent Cooperation Treaty	PCT/US2008/007331	June 12, 2008
	European Patent Convention	08252023.0	June 12, 2008
	Argentina	P080102501	June 12, 2008
	Pakistan	6842008	June 12, 2008
	Taiwan	97122018	June 12, 2008
	Venezuela	2008001156	June 12, 2008
	Hong Kong	09105433.5	June 17, 2009
	European Patent Convention	09075359.1	June 12, 2008
	Australia	2008267048	June 12, 2008
	Brazil	PI08139113	June 12, 2008
	Canada	2692028	June 12, 2008
	China (People's Republic)	200880021601.3	June 12, 2008
	Colombia	09141805	June 12, 2008
	India	8182DELNP2009	June 12, 2008
	Japan	2010512186	June 12, 2008
	Mexico	MXa2009013565	June 12, 2008
	South Africa	200909079	June 12, 2008
	Korea, Republic of	1020107000675	June 12, 2008
	Switzerland	08252023.0	June 12, 2008
	Germany	08252023.0	June 12, 2008
	Spain	08252023.0	June 12, 2008
	France	08252023.0	June 12, 2008
	United Kingdom	08252023.0	June 12, 2008
	Italy	08252023.0	June 12, 2008
	Hong Kong	10104316.7	April 30, 2010
	United States of America	12/755,184	April 6, 2010
	European Patent Convention	11155667.6	June 12, 2008
	Hong Kong	11109198.8	August 31, 2011
	China (People's Republic)	2.0111E+11	June 12, 2008
	Brazil	(divisional) instructions to file sent	



	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
46	<u>4-oxoquinoline derivatives</u>		
	United States of America	12/283,620	September 12, 2008
	Patent Cooperation Treaty	PCT/US2008/010662	September 12, 2008
	Australia	2008299931	September 12, 2008
	Canada	2698825	September 12, 2008
	European Patent Convention	08830735.0	September 12, 2008
	India	2377DELNP2010	September 12, 2008
	Mexico	MXA2010002679	September 12, 2008
	United States of America	13/153,952	June 6, 2011
47	<u>Deuterated darunavir</u>		
	Patent Cooperation Treaty	PCT/US2008/012079	October 24, 2008
	United States of America	12/387,327	April 28, 2009
	Australia	2008317375	October 24, 2008
	Canada	2703591	October 24, 2008
	European Patent Convention	08843302.4	October 24, 2008
48	<u>Peptides for the treatment of HCV infections</u>		
	Patent Cooperation Treaty	PCT/US2008/012949	November 20, 2008
	European Patent Convention	08851195.1	November 20, 2008
	Japan	2010534960	November 20, 2008
	Hong Kong	11101960.1	February 28, 2011
49	<u>Endothelin receptor antagonists</u>		
	United States of America	12/008,698	January 11, 2008
	Patent Cooperation Treaty	PCT/US2008/000384	January 11, 2008
	United States of America	12/460,575	July 20, 2009
50	<u>Selective endothelin type-A antagonists</u>		
	Patent Cooperation Treaty	PCT/US2008/001358	February 1, 2008
	European Patent Convention	8713376.5	February 1, 2008
51	<u>Deuterated piperazine derivatives as anti-anginal compounds</u>		
	United States of America	12/075,107	March 7, 2008
	Patent Cooperation Treaty	PCT/US2008/003183	March 7, 2008
	European Patent Convention	08726679.7	March 7, 2008
	Japan	2009552765	March 7, 2008
	Belgium	08726679.7	March 7, 2008
	France	08726679.7	March 7, 2008
	Germany	08726679.7	March 7, 2008
	United Kingdom	08726679.7	March 7, 2008
	Italy	08726679.7	March 7, 2008
	Spain	08726679.7	March 7, 2008
	Switzerland	08726679.7	March 7, 2008

	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
52	<u>Tricyclic benzo[5,6]cyclohepta[1, 2- B]pyridine derivatives and uses thereof</u>		
	Patent Cooperation Treaty	PCT/US2009/002372	April 16, 2009
	United States of America	12/937,933	April 16, 2009
53	<u>Piperazine derivatives</u>		
	United States of America	12/386,492	April 17, 2009
	Patent Cooperation Treaty	PCT/US2009/002424	April 17, 2009
	United States of America	12/603,380	October 21, 2009
54	<u>Xanthenone-4-acetic acid derivatives</u>		
	Patent Cooperation Treaty	PCT/US2009/060996	October 16, 2009
	United States of America	13/124,626	October 16, 2009
55	<u>Hydroxyethylamino sulfonamide derivatives</u>		
	Patent Cooperation Treaty	PCT/US2009/005773	October 23, 2009
	United States of America	13/125,464	October 23, 2009
	European Patent Convention	09822333.2	October 23, 2009
56	<u>Hydroxyethylamino sulfonamide derivatives</u>		
	United States of America	12/771,551	April 30, 2010
	Patent Cooperation Treaty	PCT/US2010/033206	April 30, 2010
57	<u>Deuterium modified benzimidazoles</u>		
	Patent Cooperation Treaty	PCT/US2010/034962	May 14, 2010
	United States of America	13/320,653	November 15, 2011
58	<u>Peptides for the treatment of HCV infections</u>		
	Patent Cooperation Treaty	PCT/US2010/036682	May 28, 2010
	United States of America	13/321,785	November 21, 2011
59	<u>Aminoquinoline derivatives</u>		
	Patent Cooperation Treaty	PCT/US2011/021715	January 19, 2011
60	<u>Tetrahydroisoquinoline derivatives</u>		
	United States of America	12/338,754	December 18, 2008
	Patent Cooperation Treaty	PCT/US2008/087477	December 18, 2008
	European Patent Convention	08862459.8	December 18, 2008
61	<u>Inhibitors of cholesterol ester transfer protein</u>		
	United States of America	12/049,074	March 14, 2008
	Patent Cooperation Treaty	PCT/US2008/003449	March 14, 2008
	Canada	2681628	March 14, 2008
	European Patent Convention	08742105.3	March 14, 2008
	Hong Kong	10105723.1	June 9, 2010

	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
62	<u>Synthetic triterpenoid derivatives</u> Patent Cooperation Treaty	PCT/US2011/049163	August 25, 2011
63	<u>Atazanavir metabolite derivatives</u> United States of America	61/495,877	June 10, 2011
64	<u>Atazanavir metabolite derivatives</u> United States of America	61/495,870	June 10, 2011
65	<u>Deuterated 18-methoxycoronadidine</u> United States of America	61/505,361	July 7, 2011
66	<u>Substituted diphenylpyrazine derivatives</u> Patent Cooperation Treaty	PCT/US2010/044704	August 6, 2010
67	<u>Niacin prodrugs and deuterated versions thereof</u> United States of America Patent Cooperation Treaty	12/948,484 PCT/US2010/057051	November 17, 2010 November 17, 2010
68	<u>Pharmaceutical calcimimetics</u> United States of America Canada Patent Cooperation Treaty	12/975,464 2701638 PCT/US2008/059023	December 22, 2010 April 1, 2008 April 1, 2008
69	<u>1,2-benzisoxazol-3-yl compounds</u> United States of America Patent Cooperation Treaty	12/102,164 PCT/US2008/060210	April 14, 2008 April 14, 2008
70	<u>Naphthyl(ethyl)acetamides</u> United States of America Canada European Patent Convention Japan Patent Cooperation Treaty	12/112,722 2685924 08769252.1 2009-551067 PCT/US2008/062039	April 30, 2008 April 30, 2008 April 30, 2008 April 30, 2008 April 30, 2008
71	<u>Morphinan compounds</u> United States of America United States of America United States of America Australia Australia Brazil Canada	12/112,936 13/118,912 13/118,935 2008247818 (divisional) instructions to file sent PI0811478-1 2685723	April 30, 2008 May 31, 2011 May 31, 2011 April 30, 2008 April 30, 2008 April 30, 2008 April 30, 2008

Title	Application Number	Filing Date
China (People's Republic)	200880017768.2	April 30, 2008
European Patent Convention	08747238.7	April 30, 2008
European Patent Convention	11000763.0	April 30, 2008
European Patent Convention	11000764.8	April 30, 2008
Hong Kong	1010707.6	August 9, 2010
Hong Kong	11109618.0	September 12, 2011
Hong Kong	11109620.6	September 12, 2011
India	7533/DELNP/2009	April 30, 2008
Japan	2010-506617	April 30, 2008
Mexico	2009/011958	April 30, 2008
Mexico	MX/a/2011/010560	October 6, 2011
Patent Cooperation Treaty	PCT/US2008/062089	April 30, 2008
72 <u>N-phenyl-2-pyrimidineamine derivatives</u>		
United States of America	12/539,091	August 11, 2009
Patent Cooperation Treaty	PCT/US2009/053384	August 11, 2009
73 <u>Deuterated etravirine</u>		
United States of America	12/288,186	October 17, 2008
European Patent Convention	08839230.3	October 17, 2008
Hong Kong	11101126.2	October 17, 2008
Patent Cooperation Treaty	PCT/US2008/011856	October 17, 2008
74 <u>Deuterated morpholinyl compounds</u>		
United States of America	12/106,127	April 18, 2008
Australia	2008242703	April 18, 2008
Brazil	P10810362-3	April 18, 2008
Canada	2686545	April 18, 2008
China (People's Republic)	200880012551.2	April 18, 2008
European Patent Convention	08746315.4	April 18, 2008
India	7500/DELNP/2009	April 18, 2008
Japan	2010-504289	April 18, 2008
Japan	2011-18410	January 31, 2011
South Korea	10-2009-7024119	April 18, 2008
South Korea	10-2010-7020029	September 8, 2010
Patent Cooperation Treaty	PCT/US2008/060877	April 18, 2008
75 <u>Deuterated 2-propylpentanoic acid compounds</u>		
European Patent Convention	09744570.4	October 28, 2009
United States of America	13/126,384	April 27, 2011
Patent Cooperation Treaty	PCT/US2009/062397	October 28, 2009
76 <u>Novel pyrimidinecarboxamide derivatives</u>		
United States of America	12/169,367	July 8, 2008
United States of America	12/712,399	February 25, 2010
Canada	2702317	July 8, 2008
Patent Cooperation Treaty	PCT/US2008/069425	July 8, 2008

Title	Application Number	Filing Date
77 <u>Deuterated tizanidine</u> United States of America Patent Cooperation Treaty	12/993,530 PCT/US2009/045245	February 10, 2011 May 27, 2009
78 <u>Analogues of d-dextromethorphan</u> Australia Brazil Canada China Eurasia European Patent Convention European Patent Convention Hong Kong India India Japan South Korea South Korea Mexico Philippines United States of America Patent Cooperation Treaty South Africa	2009293123 PI0918760-0 2737811 200980142670.4 201170473 09792714.9 11188848.3 N/A 2116/DELNP/2011 (divisional) instructions to file sent 2011-527994 10-2011-7008130 10-2011-7027474 N/MX/a/2011/002994 1-2011-500574 13/119,905 PCT/US2009/057476 2011/02113	September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 September 18, 2009 November 18, 2011 September 18, 2009 September 18, 2009 July 1, 2011 September 18, 2009 September 18, 2009
79 <u>Morphinan compounds</u> United States of America	13/155,827	June 8, 2011
80 <u>Combination of morphinan compounds and antidepressant for the treatment of pseudobulbar affect, neurological diseases, intractable and chronic pain and brain injury</u> European Patent Convention European Patent Convention United States of America Patent Cooperation Treaty	09744582.9 11180603.0 13/126,397 PCT/US2009/062783	October 30, 2009 October 30, 2009 April 27, 2011 October 30, 2009
81 <u>Methods for the treatment of neurological diseases and conditions</u> European Patent Convention European Patent Convention United States of America Patent Cooperation Treaty	09744581.1 11180608.9 13/126,447 PCT/US2009/062779	October 30, 2009 October 30, 2009 April 27, 2011 October 30, 2009

	<b>Title</b>	<b>Application Number</b>	<b>Filing Date</b>
82	<u>Substituted azaindoles</u> Patent Cooperation Treaty	PCT/US2010/056447	November 12, 2010
83	<u>Pyrimidine derivatives</u> Patent Cooperation Treaty	PCT/US2011/025472	February 18, 2011
84	<u>Deuterated tetrahydronaphthalene derivatives</u> United States of America Patent Cooperation Treaty	13/038,533 PCT/US2011/026787	March 2, 2011 March 2, 2011
85	<u>Tetrahydronaphthalene derivatives</u> United States of America	13/227,047	September 7, 2011
86	<u>Novel pyrimidinecarboxamide derivatives</u> Patent Cooperation Treaty	PCT/US2011/043872	July 13, 2011
87	<u>Substituted azaindoles</u> United States of America Patent Cooperation Treaty	13/230,970 PCT/US2011/051297	September 13, 2011 September 13, 2011
88	<u>Substituted tetracyclines</u> Patent Cooperation Treaty	PCT/US2011/060310	November 11, 2011
89	<u>Deuterated chlophedianol</u> United States of America	61/436,634	January 27, 2011
90	<u>2-amino-naphthyridine derivatives</u> United States of America	61/446,733	February 25, 2011
91	<u>Deuterated prelandenant</u> United States of America	61/466,310	March 22, 2011
92	<u>Deuterated N-butyl bumetanide</u> United States of America	61/484,412	May 10, 2011
93	<u>Synthetic triterpenoid derivatives</u> Patent Cooperation Treaty	US11/34984	May 3, 2011
94	<u>[5,6]-dihydro-2H-pyran-2-one derivatives</u> Patent Cooperation Treaty	US11/40731	June 16, 2011
95	<u>Derivatives of pyrazole-substituted amino-heteroaryl compounds</u> United States of America	61/448,887	March 3, 2011

Title	Application Number	Filing Date
96 <u>Novel pharmaceutical compounds</u>		
Australia	2006275702	July 28, 2006
China (People's Republic)	200680036393.50	July 28, 2006
Japan	2008-524206	July 28, 2006
United States of America	11/704,555	February 8, 2007
United States of America	12/954,591	November 24, 2010
European Patent Convention	11155798.9	July 28, 2006
97 <u>Biphenyl-pyrazolecarboxamide compounds</u>		
United States of America	11/521,926	September 14, 2006
98 <u>Novel 1,2,3,4-tetrahydroquinoline derivatives</u>		
United States of America	12/296,927	September 30, 2009
99 <u>3-(dihydro-1H-pyrazolo[4,3-D]pyrimidin-5-YL)-4-propoxybenzenesulfonamide derivatives and methods of use</u>		
Korea, Republic of	10-2009-7010321	October 22, 2007
United States of America	11/876,754	October 22, 2007
Japan	2009-533595	October 22, 2007
India	868/MUMNP/2009	October 22, 2007
Mexico	MX/a/2009/003941	October 22, 2007
100 <u>Dibenzothiazepine derivatives</u>		
United States of America	12/425,957	April 17, 2009
101 <u>Triazolyl tropane derivatives</u>		
United States of America	11/941,925	November 16, 2007
United States of America	13/044,534	March 9, 2011
102 <u>Heterocyclic kinase inhibitors</u>		
European Patent Convention	8859849.5	December 9, 2008
Hong Kong	11102019	December 9, 2008
United States of America	12/331,431	December 9, 2008
103 <u>Vandetanib derivatives</u>		
United States of America	12/864,219	November 16, 2010
104 <u>Derivatives of gefitinib</u>		
European Patent Convention	9703515.8	January 22, 2009
Hong Kong	10111408.1	January 22, 2009
United States of America	12/358,238	January 22, 2009
Japan	2010-544356	January 22, 2009
United States of America	12/946,856	November 15, 2010

	Title	Application Number	Filing Date
105	<u>Quinazoline derivatives and methods of treatment</u> United States of America	11/957,442 12/694,249	December 15, 2007 January 26, 2010
106	<u>Derivatives of 3-(2-hydroxy-5-methoxyphenyl)-N,N-diisopropyl-3-phenylpropylamine and methods of use thereof</u> China (People's Republic) Korea, Republic of United States of America Japan	200980121626.50 10-2010-7025129 12/937,262 2011-504185	April 9, 2009 April 9, 2009 January 26, 2011 April 9, 2009
107	<u>Substituted triazolo-pyridazine derivatives</u> Canada European Patent Convention Eurasian Patent Organization Australia Brazil China (People's Republic) Korea, Republic of Philippines South Africa India Japan Mexico United States of America United States of America	2735549 9810685.9 201100409 2009285533 PI0912928-6 200980140350.50 10-2011-7006632 1-2011-500500 2011/02123 438/MUMNP/2011 2011-525250 MX/a/2011/002278 12/550,346 13/174,662	August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 August 28, 2009 February 4, 2009 June 30, 2011
108	<u>3-(dihydro-1H-pyrazolo[4,3-D]pyrimidin-5-yl)-4-propoxybenzenesulfonamide derivatives and methods of use</u> United States of America	12/365,883	February 4, 2009
109	<u>Quinazoline derivatives and methods of treatment</u> China (People's Republic) Korea, Republic of Japan Hong Kong	200980118829.90 10-2010-7024204 2011-502126 11108819.9	March 27, 2009 March 27, 2009 March 27, 2009 March 27, 2009
110	<u>4-aminoquinazoline prodrugs</u> United States of America	12/986,135	January 6, 2011



Title	Application Number	Filing Date
111 <u>Deuterated macrocyclic inhibitors of viral NS3 protease</u> United States of America	13/092,801	April 22, 2011
112 <u>Substituted triazolophthalazine derivatives</u> Patent Cooperation Treaty United States of America	PCT/US2010/045508 12/856,360	August 13, 2010 August 13, 2010
113 <u>Substituted benzimidazoles</u> Patent Cooperation Treaty United States of America	PCT/US2010/052915 12/905,835	October 15, 2010 October 15, 2010
114 <u>Substituted imidazotriazines</u> Patent Cooperation Treaty United States of America	PCT/US2010/043097 12/842,589	July 23, 2010 July 23, 2010
115 <u>Substituted triazolo-pyridazine derivatives</u> Patent Cooperation Treaty United States of America	PCT/US2010/039497 12/820,570	June 22, 2010 June 22, 2010
116 <u>2-oxo-1-pyrrolidine derivatives</u> United States of America Patent Cooperation Treaty	13/002,267 PCT/US09/49224	June 30, 2009 June 30, 2009
117 <u>Deuterated Tivozanib</u> United States of America	61/496,201	June 13, 2011
118 <u>Analogues of cilostazol</u> United States of America United States of America EP Patent Cooperation Treaty	12/150,107 12/644,758 8743256.3 PCT/US08/05301	April 24, 2008 December 22, 2009 November 25, 2009 April 24, 2008
119 <u>4-aminoquinazolines</u> Australia Canada United States of America China (People's Republic) European Union India Japan Mexico United States of America Patent Cooperation Treaty Korea	2007288204 2,661,223 12/879,905 200780093901.3 EP07811504.5 423/MUMNP/2009 2009-525631 MX/a/2009/001814 11/895,174 PCT/US2007/018655 2009-0042994	August 22, 2007 August 22, 2007 September 10, 2010 August 22, 2007 August 22, 2007 August 22, 2007 August 22, 2007 August 22, 2007 August 22, 2007 August 22, 2007 August 22, 2007 August 22, 2007

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**Concert Pharmaceuticals, Inc. Trademarks**

<u>COUNTRY</u>	<u>MARK</u>	<u>REG. NO./ SERIAL NO.</u>	<u>ISSUED/ FILED</u>	<u>GOOD/SERVICES WITH CLASS</u>	<u>NOTES/ CURRENT STATUS</u>
Argentina	CONCERT PHARMACEUTICALS INC.	2210582	01/29/2008	Full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/29/2018
Australia	CONCERT PHARMACEUTICALS INC.	1157917	1/25/2007	A full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/25/2017
Australia	CONCERT PHARMACEUTICALS INC. (stylized)	1157926	1/25/2007	A full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/25/2017
Canada	CONCERT PHARMACEUTICALS INC.	1,332,456	1/24/2007	A full line of pharmaceutical and biopharmaceutical preparations in Class 5	Pending
Canada	CONCERT PHARMACEUTICALS INC. (stylized)	1,332,461	1/24/2007	A full line of pharmaceutical and bio pharmaceutical preparations namely, pharmaceutical compounds for use in treating diseases and health conditions namely, pharmaceuticals for the treatment of inflammatory diseases, infectious diseases, diseases and conditions of the central nervous system, cancer, and cardiovascular disease.	Pending
China	CONCERT PHARMACEUTICALS INC.	5,868,162	3/7/2011	Medical nutriment	Registered, expires 3/6/2021
China	CONCERT PHARMACEUTICALS INC. (stylized)	5,868,163	3/7/2011	Medical nutriment	Registered, expires 3/6/2021

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<u>COUNTRY</u>	<u>MARK</u>	<u>REG. NO./ SERIAL NO.</u>	<u>ISSUED/ FILED</u>	<u>GOOD/SERVICES WITH CLASS</u>	<u>NOTES/ CURRENT STATUS</u>
European Community	CONCERT PHARMACEUTICALS INC.	5641204	1/30/2008	Pharmaceutical and veterinary preparations; biopharmaceutical preparations; full line of pharmaceutical and biopharmaceutical preparations in Class 5.  Pharmaceutical research and development services in Class 42.	Registered, expires 1/25/2017
European Community	CONCERT PHARMACEUTICALS INC. (stylized)	5641295	1/23/2008	Pharmaceutical and veterinary preparations; biopharmaceutical preparations; full line of pharmaceutical and biopharmaceutical preparations in Class 5.  Pharmaceutical research and development services in Class 42.	Registered, expires 1/25/2017
India	CONCERT PHARMACEUTICALS INC.	1526295	1/25/2007	Full line of pharmaceutical and biopharmaceutical preparations	Pending
Israel	CONCERT PHARMACEUTICALS INC.	197279	5/10/2009	Full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/25/2017
Japan	CONCERT PHARMACEUTICALS INC. (stylized)	5060415	7/6/2007	Pharmaceuticals in Class 5	Registered, expires 7/6/2017
Japan	CONCERT PHARMACEUTICALS INC.	5060416	7/6/2007	Pharmaceuticals in Class 5	Registered, expires 7/6/2017

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**Concert Pharmaceuticals, Inc. Trademarks**

<u>COUNTRY</u>	<u>MARK</u>	<u>REG. NO./ SERIAL NO.</u>	<u>ISSUED/ FILED</u>	<u>GOOD/SERVICES WITH CLASS</u>	<u>NOTES/ CURRENT STATUS</u>
New Zealand	CONCERT PHARMACEUTICALS INC.	762543	7/25/2006	Pharmaceutical and biopharmaceutical preparations but not including pharmaceutical preparations to treat hyperactivity and attention deficit disorder in children in Class 5	Registered, expires 7/25/2016
Norway	CONCERT PHARMACEUTICALS INC.	239760	6/20/2007	Complete set of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 6/20/17
Russian Federation	CONCERT PHARMACEUTICALS INC.	346050	3/20/2008	Full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/25/2017
Singapore	CONCERT PHARMACEUTICALS INC.	T07/017771	1/25/2007	Full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, Renewal due 1/25/2017
South Africa	CONCERT PHARMACEUTICALS INC.	2007/01346	4/22/2010	Full line of pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/25/2017
Switzerland	CONCERT PHARMACEUTICALS INC.	559007	6/1/2007	Pharmaceutical and biopharmaceutical preparations in Class 5	Registered, expires 1/25/2017
Taiwan	CONCERT PHARMACEUTICALS	1297040	1/16/2008	Western medicine, biological medicine preparations in Class 5	Registered, Renewal due 1/15/2018
United States	CONCERT PHARMACEUTICALS INC.	78937102	7/25/2006	Prescription pharmaceutical and biopharmaceutical preparations, namely, pharmaceutical preparations for use in treating inflammatory diseases, infectious diseases, cancer and cardiovascular disease in Class 5	Published

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**Concert Pharmaceuticals, Inc. Trademarks**

<u>COUNTRY</u>	<u>MARK</u>	<u>REG. NO./ SERIAL NO.</u>	<u>ISSUED/ FILED</u>	<u>GOOD/SERVICES WITH CLASS</u>	<u>NOTES/ CURRENT STATUS</u>
United States	CONCERT PHARMACEUTICALS INC. (stylized)	78937142	7/25/2006	Pharmaceutical research and development services in Class 42  Prescription pharmaceutical and biopharmaceutical preparations, namely, pharmaceutical preparations for use in treating inflammatory diseases, infectious diseases, cancer and cardiovascular disease in Class 5  Pharmaceutical research and development services in Class 42	Published

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**Concert Pharmaceuticals, Inc. Trademarks**

<u>COUNTRY</u>	<u>MARK</u>	<u>REG. NO./ SERIAL NO.</u>	<u>ISSUED/ FILED</u>	<u>GOOD/SERVICES WITH CLASS</u>	<u>NOTES/ CURRENT STATUS</u>
United States	DCE PLATFORM	77907107	1/7/2010	Pharmaceutical compounds for clinical study use in drug research, namely, deuterium-based compounds for research use; chemical compounds for making and studying pharmaceutical compounds, namely, deuterium-based compounds wherein each chemical compound contains one or more deuterium atoms for use in the manufacture of pharmaceutical preparations; pharmaceutical compounds for clinical study for research purposes and laboratory use in drug research, namely, deuterium-based compounds in Class 1  Pharmaceutical compounds for use in treating diseases and health conditions, namely, pharmaceuticals for the treatment of treatment of inflammatory and fibrotic diseases, infectious diseases, diseases and conditions of the central nervous system, cancer, and cardiovascular and renal disease; pharmaceutical compounds for clinical study for therapeutic purposes, namely, deuterium-based compounds in Class 5  Scientific and medical research services; medical testing services for research purposes; conducting early evaluations in the field of new pharmaceuticals; drug discovery services; pharmaceutical research services in Class 42	Allowed

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**EXHIBIT E**

**BORROWER'S DEPOSIT ACCOUNTS AND INVESTMENT ACCOUNTS**

<u>Bank Name</u>	<u>Account Number</u>	<u>Branch Address</u>	<u>Company/Subsidiary</u>
Silicon Valley Bank	3300530507	3003 Tasman Drive Santa Clara, CA 95054	Company <input checked="" type="checkbox"/> OR Name of Sub
Silicon Valley Bank	3300580848	3003 Tasman Drive Santa Clara, CA 95054	Company <input checked="" type="checkbox"/> OR Name of Sub
State Street Bank	DE3085	1200 Crown Colony Drive Quincy, MA 02169	Company <input checked="" type="checkbox"/> OR Name of Sub
State Street Bank	DE3086	1200 Crown Colony Drive Quincy, MA 02169	Company <input type="checkbox"/> OR Name of Sub Concert Pharmaceuticals Securities Corporation
Note: All cash/investments moved to DE3085. Concert requested on 12/9/11 that the DE3086 be closed.			
SVB Securities	486-04255	3003 Tasman Drive Santa Clara, CA 95054	Company <input checked="" type="checkbox"/> OR Name of Sub
SVB Securities	486-05241	3003 Tasman Drive Santa Clara, CA 95054	Company <input checked="" type="checkbox"/> OR Name of Sub

**EXHIBIT F**

**COMPLIANCE CERTIFICATE**

Hercules Technology Growth Capital, Inc.  
400 Hamilton Avenue, Suite 310  
Palo Alto, CA 94301

Reference is made to that certain Loan and Security Agreement dated December , 2011 and all ancillary documents entered into in connection with such Loan and Security Agreement all as may be amended from time to time, (hereinafter referred to collectively as the "Loan Agreement") between Hercules Technology Growth Capital, Inc. ("Hercules") as Lender and **CONCERT PHARMACEUTICALS, INC.** (the "Company") as Borrower. All capitalized terms not defined herein shall have the same meaning as defined in the Loan Agreement.

The undersigned is an Officer of the Company, knowledgeable of all Company financial matters, and is authorized to provide certification of information regarding the Company; hereby certifies, in such capacity, that in accordance with the terms and conditions of the Loan Agreement, the Company is in compliance for the period ending of all covenants, conditions and terms and hereby reaffirms that all representations and warranties contained therein are true and correct in all material respects on and as of the date of this Compliance Certificate. Attached are the required documents supporting the above certification. The undersigned further certifies on behalf of the Company that these are prepared in accordance with GAAP, except (i) for the absence of footnotes, (ii) that they are subject to normal year end adjustments, (iii) they do not contain certain non-cash items, and (iv) that they are subject to adjustment with respect to revenue recognition for upfront and milestone payments, and are consistent from one period to the next except as explained below.

REPORTING REQUIREMENT	REQUIRED	CHECK IF ATTACHED
Interim Financial Statements	Monthly within 30 days	
Interim Financial Statements	Quarterly within 45 days	
Audited Financial Statements	FYE within 180 days	

Very Truly Yours,

**CONCERT PHARMACEUTICALS, INC.**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Its: \_\_\_\_\_



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## EXHIBIT G

### FORM OF JOINDER AGREEMENT

This Joinder Agreement (the "Joinder Agreement") is made and dated as of \_\_\_\_\_, 201\_\_\_\_, and is entered into by and between \_\_\_\_\_, a \_\_\_\_\_ corporation ("Subsidiary"), and Hercules Technology Growth Capital, Inc. as a Lender.

#### RECITALS

A. Subsidiary's Affiliate, **CONCERT PHARMACEUTICALS, INC.** ("Company") has entered into that certain Loan and Security Agreement dated December \_\_\_\_\_, 2011, with Lender, as such agreement may be amended (the "Loan Agreement"), together with the other agreements executed and delivered in connection therewith;

B. Subsidiary acknowledges and agrees that it will benefit both directly and indirectly from Company's execution of the Loan Agreement and the other agreements executed and delivered in connection therewith;

#### AGREEMENT

NOW THEREFORE, Subsidiary and Lender agree as follows:

1. The recitals set forth above are incorporated into and made part of this Joinder Agreement. Capitalized terms not defined herein shall have the meaning provided in the Loan Agreement.
2. By signing this Joinder Agreement, Subsidiary shall be bound by the terms and conditions of the Loan Agreement the same as if it were the Borrower (as defined in the Loan Agreement) under the Loan Agreement, mutatis mutandis, provided however, that Lender shall have no duties, responsibilities or obligations to Subsidiary arising under or related to the Loan Agreement or the other agreements executed and delivered in connection therewith. Rather, to the extent that Lender has any duties, responsibilities or obligations arising under or related to the Loan Agreement or the other agreements executed and delivered in connection therewith, those duties, responsibilities or obligations shall flow only to Company and not to Subsidiary or any other person or entity. By way of example (and not an exclusive list): (a) Lender's providing notice to Company in accordance with the Loan Agreement or as otherwise agreed between Company and Lender shall be deemed provided to Subsidiary; (b) a Lender's providing an Advance to Company shall be deemed an Advance to Subsidiary; and (c) Subsidiary shall have no right to request an Advance or make any other demand on Lender.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

**SUBSIDIARY:**

\_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
Facsimile: \_\_\_\_\_

**LENDER:**

**HERCULES TECHNOLOGY GROWTH CAPITAL, INC.**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Its: \_\_\_\_\_

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**EXHIBIT H**

**ACH DEBIT AUTHORIZATION AGREEMENT**

Hercules Technology Growth Capital, Inc.  
400 Hamilton Avenue, Suite 310  
Palo Alto, CA 94301

Re: Loan and Security Agreement dated December , 2011 between CONCERT PHARMACEUTICALS, INC. ("Borrower") and Hercules Technology Growth Capital, Inc. ("Company") (the "Agreement")

In connection with the above referenced Agreement, the Borrower hereby authorizes the Company to initiate debit entries for the periodic payments due under the Agreement to the Borrower's account indicated below. The Borrower authorizes the depository institution named below to debit to such account.

DEPOSITORY NAME

BRANCH

CITY

STATE AND ZIP CODE

TRANSIT/ABA NUMBER

ACCOUNT NUMBER

This authority will remain in full force and effect so long as any amounts are due under the Agreement.

CONCERT PHARMACEUTICALS, INC.

By: \_\_\_\_\_

Date: \_\_\_\_\_

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**SCHEDULE 1**  
**SUBSIDIARIES**

Concert Pharmaceuticals Securities Corp., a Massachusetts corporation

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**SCHEDULE 1A**

**EXISTING PERMITTED INDEBTEDNESS**

None.

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**SCHEDULE 1B**

**EXISTING PERMITTED INVESTMENTS**

Investment in Concert Pharmaceuticals Securities Corp.

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**SCHEDULE 1C**

**EXISTING PERMITTED LIENS**

None.

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**SCHEDULE 5.3**  
**CONSENTS, ETC.**

None.



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**SCHEDULE 5.5**

**ACTIONS BEFORE GOVERNMENTAL AUTHORITIES**

None.

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**SCHEDULE 5.8**

**TAX MATTERS**

None.

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**SCHEDULE 5.9**

**INTELLECTUAL PROPERTY CLAIMS**

None.

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**SCHEDULE 5.10**

**INTELLECTUAL PROPERTY**

None.

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**SCHEDULE 5.11**

**BORROWER PRODUCTS**

None.

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**SCHEDULE 5.14**  
**CAPITALIZATION**

Borrower owns all of the outstanding capital stock of Concert Pharmaceuticals Securities Corp. See attached capitalization table of Borrower.

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FIRST AMENDMENT TO LOAN AND SECURITY AGREEMENT

THIS FIRST AMENDMENT TO LOAN AND SECURITY AGREEMENT (“Amendment”) is made and dated as of January , 2014, and is entered into by and between **CONCERT PHARMACEUTICALS, INC.**, a Delaware corporation (the “Borrower”), and **HERCULES TECHNOLOGY GROWTH CAPITAL, INC.**, a Maryland corporation (“Lender”). Capitalized terms used herein without definition shall have the meanings ascribed to such terms in the Loan Agreement (defined below).

**RECITALS**

- A. The Borrower and the Lender are party to that certain Loan and Security Agreement dated as of December 22, 2011 (the “Loan Agreement”).
- B. Each of the Borrower’s audited financial statements delivered to the Lender under the Loan Agreement refer to certain liabilities of the Borrower to the landlord in connection with tenant improvements under the Borrower’s real estate lease.
- C. The parties desire to amend the Loan Agreement on the terms set forth herein to clarify that such liabilities to the landlord are permitted under the terms of the Loan Agreement.

**AGREEMENT**

NOW, THEREFORE, Borrower and Lender agree as follows:

1. Effective as of December 22, 2011, Schedule 1A of the Loan Agreement is hereby amended and replaced with Schedule 1A attached hereto as Annex A.
2. The Lender waives any defaults or events of default arising from the items on Annex A not being included on Schedule 1.1 on the Closing Date.
3. Except as modified herein, the Loan Agreement remains unchanged and in full force and effect. The Borrower hereby ratifies, confirms and reaffirms the terms and conditions of the Loan Agreement and the Loan Documents, and all grants of security by the Borrower to the Lender in connection therewith.
4. This Amendment shall be governed by, and construed and enforced in accordance with, the laws of the Commonwealth of Massachusetts, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

[Remainder of Page Intentionally Blank]

IN WITNESS WHEREOF, Borrower and Lender have duly executed and delivered this First Amendment to Loan and Security Agreement as of the day and year first above written.

**BORROWER:**

**CONCERT PHARMACEUTICALS, INC.**

Signature: /s/ Nancy Stuart

Print Name: Nancy Stuart

Title: Chief Operating Officer

Accepted in Boston, Massachusetts:

**LENDER:**

**HERCULES TECHNOLOGY GROWTH CAPITAL,  
INC.**

By: /s/ Ben Bang

Name: Ben Bang

Its: Senior Council



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Annex A

Schedule 1A

**EXISTING PERMITTED INDEBTEDNESS**

Pursuant to the Borrower's real estate lease with One Ledgemont LLC with respect to the lease of the Borrower's headquarters in Lexington, Massachusetts in the building known as Ledgemont Development Center, and as more fully described in the Borrower's audited financial statements for fiscal year end 2008 and subsequent years, the Borrower is obligated to reimburse the landlord for certain leasehold improvement costs, in the original amount of \$2.3 million plus interest.

## SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT

THIS SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT (“Amendment”) is made and dated as of August 11, 2014, and is entered into by and between **CONCERT PHARMACEUTICALS, INC.**, a Delaware corporation (the “Borrower”), and **HERCULES TECHNOLOGY GROWTH CAPITAL, INC.**, a Maryland corporation (“Lender”). Capitalized terms used herein without definition shall have the meanings ascribed to such terms in the Loan Agreement (defined below).

### RECITALS

A. The Borrower and the Lender are party to that certain Loan and Security Agreement dated as of December 22, 2011, as amended as of January 14, 2014 (the “Loan Agreement”).

B. The parties desire to amend the Loan Agreement on the terms set forth herein.

### AGREEMENT

NOW, THEREFORE, Borrower and Lender agree as follows:

1. Section 7.1(c) of the Loan Agreement is hereby amended and restated as follows:

(c) as soon as practicable and in any event within ninety days (90 days) after the end of each fiscal year, audited financial statements as of the end of such year (prepared on a consolidated basis, if applicable), including balance sheet and related statements of income and cash flows, and setting forth in comparative form the corresponding figures for the preceding fiscal year, certified by a firm of independent certified public accountants selected by Borrower and reasonably acceptable to Lender, accompanied by an audit report from such accountants which is unqualified as to scope of audit;

2. Section 7.1 of the Loan Agreement is hereby amended by deleting the final paragraph thereof, and replacing it with the following:

“The executed Compliance Certificate may be sent to Lender via e-mail to jbourque@herculestech.com. All Financial Statements required to be delivered pursuant to clauses (a), (b) and (c) shall be sent via e-mail to financialstatements@herculestech.com with a copy to jbourque@herculestech.com provided that, (i) if e-mail is not available or sending such Financial Statements via e-mail is not possible, they may be sent via facsimile to Lender at: (866) 468-8916, attention Chief Credit Officer, and (ii) documents to be furnished under Sections 7.1(b) and (c) may be furnished as set forth in the following sentence. Documents required to be delivered under Sections 7.1(b), (c) and (e) shall be deemed properly delivered on the date on which the Borrower posts such documents, or provides a link thereto on the Borrower’s website, or the date on which such documents are available on Edgar or other publicly available website and Borrower notifies Lender by email of such availability.”

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3. The Compliance Certificate is hereby amended by deleting “180 days” and replacing it with “90 days.”

4. Except as modified herein, the Loan Agreement remains unchanged and in full force and effect. The Borrower hereby ratifies, confirms and reaffirms the terms and conditions of the Loan Agreement and the Loan Documents, and all grants of security by the Borrower to the Lender in connection therewith.

5. This Amendments shall be governed by, and construed and enforced in accordance with, the laws of the Commonwealth of Massachusetts, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

6. The Borrower represents that no Event of Default has occurred and is continuing.

[Remainder of Page Intentionally Blank]

IN WITNESS WHEREOF, Borrower and Lender have duly executed and delivered this First Amendment to Loan and Security Agreement as of the day and year first above written.

**BORROWER:**

**CONCERT PHARMACEUTICALS, INC.**

Signature: /s/ Ryan Daws

Print Name: Ryan Daws

Title: Chief Financial Officer

Accepted in Boston, Massachusetts:

**LENDER:**

**HERCULES TECHNOLOGY  
GROWTH CAPITAL, INC.**

By: /s/ Ben Bang

Name: Ben Bang

Its: Senior Council

## 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:

	<u>Member Annual Fee</u>	<u>Chairman Annual Fee</u>
Board of Directors	\$30,000	\$ 60,000
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.

**Subsidiaries of the Registrant**

<b><u>Name</u></b>	<b><u>Jurisdiction of Organization</u></b>
Concert Pharmaceuticals Securities Corporation	Massachusetts

**Consent of Independent Registered Public Accounting Firm**

We consent to the incorporation by reference in 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. of our report dated March 2, 2015, 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, 2014.

/s/ Ernst & Young LLP

Boston, Massachusetts  
March 2, 2015

**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 2, 2015

/s/ Roger D. Tung

Roger D. Tung  
President and 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**

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 2, 2015

/s/ Ryan Daws

Ryan Daws  
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**

In connection with the Annual Report on Form 10-K of Concert Pharmaceuticals, Inc. (the "Company") for the year ended December 31, 2014 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 2, 2015

/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.*

**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, 2014 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 2, 2015

/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.*