CONCERT PHARMACEUTICALS, INC.
Form 10-K
March 02, 2015
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

99 Hayden Avenue, Suite 500

Lexington, Massachusetts 02421

(Address of principal executive offices) (Zip Code)

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

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

Title of each class	**Name of each exchange on which registered**
Common Stock, par value $0.001 per share	**The NASDAQ Global Market**

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

None

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

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 x

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 x 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 x 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. x

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See definitions of large accelerated filer, accelerated filer, and smaller reporting

company in Rule 12b-2 of the Exchange Act. (Check one):

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

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

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 contex 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, 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.

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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®. 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®, 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.

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®, 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 moleecule-1, or KIM-1, and or tumor necrosis, or TNFRII, 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 TNFRII ($p = 0.0067$) after 48 weeks compared to placebo. Importantly, KIM-1 and TNFRII 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 $GABA_A$ receptor modulator. $GABA_A$ receptors are found in the nervous system and, when activated, reduce the transmission of certain nerve signals. $GABA_A$ receptors can possess one of a number of a subunits, including a1, a2, a3 and a5. The pharmacological effects of activating a $GABA_A$ receptor in the nervous system are believed to depend mainly on which type of a subunit the receptor contains.

Several classes of widely used drugs target $GABA_A$ 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 a 1 $GABA_A$ 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 a2, a3 and a5 $GABA_A$ 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®) and zaleplon (Sonata®), also target $GABA_A$ receptors, but activate a1 $GABA_A$ receptors significantly more potently than the other a 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 a2, a3 and a5 $GABA_A$ receptors but does not significantly activate a1 $GABA_A$ 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 a2, a3 and a5 $GABA_A$ 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 a1 $GABA_A$ 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 $GABA_A$ 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 $GABA_A$ 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 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 of or intolerability caused by our product candidates, or mistakenly believe that our product candidates are toxic or not well tolerated when that is not in fact the case.

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

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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 comment stock has been, and may continue to be, volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. The stock market in general and the market for smaller pharmaceutical and biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. The market price for our common stock may be influenced by many factors, including:

- the success 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.

	High	Low
Year Ended December 31, 2014		
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.

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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.

	Years ended December 31,			
(in thousands, except per share data)	**2014**	**2013**	**2012**	**2011**
Revenue:				
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	8,576	25,408	12,849	19,467
Operating expenses:				
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	39,174	29,818	31,459	30,813
Loss from operations	(30,598)	(4,410)	(18,610)	(11,346)
Investment income	49	21	22	44
Interest and other expense	(1,150)	(1,667)	(1,856)	(18)
Net loss	$ (31,699)	$ (6,056)	$ (20,444)	$ (11,320)
Accretion on redeemable convertible preferred stock	(55)	(396)	(388)	(1,069)
Net loss applicable to common stockholders basic and diluted	$ (31,754)	$ (6,452)	$ (20,832)	$ (12,389)
Net loss per share applicable to common stockholders basic and diluted	$ (2.00)	$ (4.99)	$ (16.15)	$ (9.66)
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

	Years ended December 31,			
Consolidated balance sheet data:	**2014**	**2013**	**2012**	**2011**
(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®. 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:

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

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.

	Year ended December 31,		
(in thousands)	**2014**	**2013**	**Change**
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	$ (31,699)	$ (6,056)	$ (25,643)

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.

	Year ended December 31,	
(in thousands)	**2014**	**2013**
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	$ 27,474	$ 21,790

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.

	Year ended December 31,		
(in thousands)	**2013**	**2012**	**Change**
Revenue:			
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
Operating expenses:			
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	$ (6,056)	$ (20,444)	$ 14,388

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.

	Year ended December 31,	
(in thousands)	**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:

	Year ended December 31,		
(in thousands)	**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	$ 3,758	$ 2,148	$ (15,459)

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:

(in thousands)	Total	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years
Long-term debt obligations[1]	$ 7,462	$ 7,462	$	$	$
Operating lease obligations[2]	5,843	1,540	3,095	1,208	
Total contractual obligations	$ 13,305	$ 9,002	$ 3,095	$ 1,208	$

(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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ITEM 8. Financial Statements and Supplementary Data
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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)	
Assets		
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	$ 84,454	$ 39,773
Liabilities, redeemable convertible preferred stock and stockholders equity (deficit)		
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		112,244

issued and outstanding in 2014 and 2013, respectively		
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)	$ 84,454	$ 39,773

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	8,576	25,408	12,849
Operating expenses:			
Research and development	27,474	21,790	24,193
General and administrative	11,700	8,028	7,266
Total operating expenses	39,174	29,818	31,459
Loss from operations	(30,598)	(4,410)	(18,610)
Investment income	49	21	22
Interest and other expense	(1,150)	(1,667)	(1,856)
Net loss	$ (31,699)	$ (6,056)	$ (20,444)
Other comprehensive loss:			
Unrealized loss on investments	(18)		(5)
Comprehensive loss	$ (31,717)	$ (6,056)	$ (20,449)
Reconciliation of net loss to net loss applicable to common stockholders:			
Net loss	$ (31,699)	$ (6,056)	$ (20,444)
Accretion on redeemable convertible preferred stock	(55)	(396)	(388)
Net loss applicable to common stockholders basic and diluted	$ (31,754)	$ (6,452)	$ (20,832)
Net loss per share applicable to common stockholders basic and diluted	$ (2.00)	$ (4.99)	$ (16.15)
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)
	Shares	Carrying 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								