CONCERT PHARMACEUTICALS, INC.
Form 10-Q
August 02, 2018
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

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FORM 10-Q

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(Mark One)
ý QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended June 30, 2018
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

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

_____

Delaware (State or other jurisdiction of incorporation or organization)	20-4839882 (I.R.S. Employer Identification No.)
99 Hayden Avenue, Suite 500 Lexington, Massachusetts (Address of principal executive offices)	02421 (Zip Code)

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

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 ý 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 ý No ¨

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

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

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

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

The number of shares outstanding of the registrant's common stock as of July 30, 2018: 23,415,025

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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements.

CONCERT PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS (UNAUDITED)
(Amounts in thousands, except share and per share data)

	June 30, 2018	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$58,359	$ 27,665
Investments, available for sale	121,988	175,500
Marketable equity securities	9,824	—
Interest receivable	511	628
Accounts receivable	25	155
Contract asset (Note 7)	16,000	—
Prepaid expenses and other current assets	2,287	1,786
Total current assets	208,994	205,734
Property and equipment, net	7,698	2,165
Restricted cash	1,557	1,557
Other assets	16	34
Income taxes receivable	2,250	2,246
Total assets	$220,515	$ 211,736
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$1,084	$ 658
Accrued expenses and other liabilities	3,389	4,299
Income taxes payable	280	46
Deferred revenue, current portion	1,413	1,442
Total current liabilities	6,166	6,445
Deferred revenue, net of current portion	9,120	8,859
Deferred lease incentive, net of current portion	3,521	—
Deferred rent, net of current portion	1,425	—
Total liabilities	20,232	15,304
Commitments (Note 10)		
Stockholders' equity:		
Preferred stock, $0.001 par value per share; 5,000,000 shares authorized; no shares issued and outstanding in 2018 and 2017, respectively	—	—
Common stock, $0.001 par value per share; 100,000,000 shares authorized; 23,491,740 and 23,147,779 shares issued and 23,414,588 and 23,140,378 outstanding in 2018 and 2017, respectively	23	23
Additional paid-in capital	278,867	273,059
Accumulated other comprehensive loss	(328)	(407)
Accumulated deficit	(78,279)	(76,243)
Total stockholders' equity	200,283	196,432
Total liabilities and stockholders' equity	$220,515	$ 211,736

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS
(UNAUDITED)
(Amounts in thousands, except per share data)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
Revenue:				
License and research and development revenue	$2	$15	$10,481	$35
Operating expenses:				
Research and development	8,862	7,285	17,518	15,522
General and administrative	5,514	5,707	11,144	10,960
Total operating expenses	14,376	12,992	28,662	26,482
Loss from operations	(14,374)	(12,977)	(18,181)	(26,447)
Investment income	660	155	1,300	292
Interest and other expense	—	(205)	—	(205)
Unrealized gain (loss) on marketable equity securities	669	—	(627)	—
Loss before tax provision	(13,045)	(13,027)	(17,508)	(26,360)
Provision for income taxes	280	—	280	—
Net Loss	$(13,325)	$(13,027)	$(17,788)	$(26,360)
Other comprehensive income (loss):				
Unrealized gain (loss) on investments, available for sale	154	(10)	79	(37)
Comprehensive loss	(13,171)	(13,037)	(17,709)	(26,397)
Net loss per share applicable to common stockholders - basic and diluted	$(0.57)	$(0.58)	$(0.76)	$(1.17)
Weighted-average number of common shares used in net loss per share applicable to common stockholders - basic and diluted	23,402	22,579	23,313	22,479

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS (UNAUDITED)
(Amounts in thousands)

	Six Months Ended June 30,	
	2018	2017
Operating activities		
Net loss	$(17,788)	$(26,360)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	509	493
Stock-based compensation expense	6,103	3,216
Accretion of premiums and discounts on investments	(123)	100
Amortization of discount on loan payable	—	42
Amortization of deferred lease incentive	(393)	(161)
Noncash license consideration (Note 7)	(10,452)	—
Unrealized loss on marketable equity securities	627	—
Loss on disposal of asset	—	4
Changes in operating assets and liabilities:		
Accounts receivable	130	(246)
Interest receivable	117	(54)
Prepaid expenses and other current assets	(500)	(965)
Other assets	17	18
Accounts payable	183	455
Accrued expenses and other liabilities	(1,205)	(8)
Income taxes payable	230	—
Deferred rent	1,356	(44)
Deferred revenue	(16)	(25)
Net cash used in operating activities	(21,205)	(23,535)
Investing activities		
Purchases of property and equipment	(1,521)	(229)
Purchases of investments	(9,429)	(64,919)
Maturities of investments	63,144	44,583
Net cash provided by (used in) investing activities	52,194	(20,565)
Financing activities		
Proceeds from loan, net	—	29,680
Repurchase of common stock pursuant to share surrender	(1,206)	—
Proceeds from exercise of stock options	911	1,456
Net cash (used in) provided by financing activities	(295)	31,136
Net increase (decrease) in cash and cash equivalents and restricted cash	30,694	(12,964)
Cash, cash equivalents and restricted cash at beginning of period	29,222	40,955
Cash, cash equivalents and restricted cash at end of period	$59,916	$27,991
Supplemental cash flow information:		
Cash paid for income taxes	$50	$—
Purchases of property and equipment unpaid at period end	$320	$6
Tenant improvements paid by landlord	$4,202	$—
Issuance of stock warrants	$—	$512

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

1. Nature of Business

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

The Company had cash and cash equivalents and investments of $180.3 million at June 30, 2018. The Company believes that its cash and cash equivalents and investments at June 30, 2018 will be sufficient to allow the Company to fund its current operating plan for at least the next twelve months. The Company may pursue additional cash resources through public or private financings and by establishing collaborations with or licensing its technology to other companies and through other arrangements.

Since its inception, the Company has generated an accumulated deficit of $78.3 million through June 30, 2018. The Company's operating results may fluctuate significantly from year to year, depending on the timing and magnitude of cash payments received pursuant to collaboration and licensing arrangements and other agreements and the timing and magnitude of clinical trial and other development activities under its current development programs. Substantially all the Company's net losses have resulted from costs incurred in connection with its research and development programs and from general and administrative costs associated with its operations. The Company expects to continue to incur significant expenses and increasing operating losses for at least the next several years.

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

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

2. Basis of Presentation and Significant Accounting Policies

Basis of Presentation

The accompanying condensed consolidated financial statements have been prepared in accordance with generally accepted accounting principles for interim financial information and with the instructions to Form 10-Q and Article 10 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by generally accepted accounting principles for complete financial statements. In the opinion of management, all adjustments, consisting of normal recurring accruals and revisions of estimates, considered necessary for a fair presentation of the condensed consolidated financial statements have been included. Interim results for the three and six months ended June 30, 2018 are not necessarily indicative of the results that may be expected for the fiscal year ending December 31, 2018 or any other future period.

The accompanying condensed consolidated financial statements reflect the accounts of Concert and its subsidiaries. All intercompany transactions between the Company and its subsidiaries have been eliminated. Management has determined that the Company operates in one segment: the development of pharmaceutical products on its own behalf or in collaboration with others. The information included in this quarterly report on Form 10-Q should be read in

conjunction with the Company’s consolidated financial statements and the accompanying notes included in the Company’s Annual Report on Form 10-K for the year ended December 31, 2017 filed with the Securities and Exchange Commission on March 1, 2018.

Use of Estimates and Summary of Significant Accounting Policies

The preparation of the consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, equity, revenue, expenses and the disclosure of contingent assets and liabilities and the Company's ability to continue as a going concern. In preparing the consolidated financial statements, management used estimates in the following areas, among others: revenue recognition; income tax expense; stock-

CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

based compensation expense; accrued expenses; and the evaluation of the existence of conditions and events that raise substantial doubt regarding the Company's ability to continue as a going concern. Actual results could differ from those estimates.

With the exception of the adoption of ASU 2014-09 during the three months ended March 31, 2018, discussed in Note 2 "Recently Adopted Accounting Pronouncements" and Note 7, there have been no material changes to the significant accounting policies previously disclosed in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017.

Recently Adopted Accounting Pronouncements

On January 1, 2018, the Company adopted ASU 2014-09, Revenue from Contracts with Customers and all related amendments ("ASC 606" or "the new revenue standard"). ASC 606 is a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The new revenue standard is based on the principle that an entity should recognize revenue to depict the transfer of 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, ASC 606 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. The new revenue standard also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts and costs to obtain or fulfill contracts. The Company applied ASC 606 on January 1, 2018 to all contracts using the modified retrospective approach. As a result of the adoption, the cumulative effect to retained earnings at January 1, 2018 was $15.8 million. The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods.

The adoption of the new standard had an immaterial impact on the Company's reported revenues, operating income and changes in operating cash flows for the three and six months ended June 30, 2018 as compared to what reported amounts would have been under legacy guidance. The cumulative effect of the changes made to the consolidated January 1, 2018 balance sheet for the adoption of the new revenue standard was as follows:

(Amounts in thousands)	Balance at December 31, 2017	ASC 606 Adjustments	Opening Balance at January 1, 2018
Assets			
Contract Asset	$ —	$ 16,000	$16,000
Liabilities and Equity			
Deferred revenue, current portion	$ 1,442	$ (14)	$1,428
Deferred revenue, net of current portion	8,859	261	9,120
Retained earnings	76,243	15,753	60,490

The impact of adopting the new revenue standard primarily relates to the treatment of the consideration held in escrow under the Vertex Asset Purchase Agreement. Under previous authoritative guidance, the Company concluded that it would not recognize the Vertex escrow consideration until it was received. However, under ASC 606, the Vertex escrow consideration represents variable consideration and was included in the transaction price at contract inception,

discussed further in Note 7. There was no material effect on the accounting for income taxes resulting from the adoption of ASC 606.

In August 2016, the FASB issued ASU 2016-15—Classification of Certain Cash Receipts and Cash Payments. The amendments in ASU 2016-15 address eight specific cash flow issues and apply to all entities that are required to present a statement of cash flows under FASB Accounting Standards Codification (ASC) 230, Statement of Cash Flows. The amendments in ASU 2016-15 are effective for public business entities for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption is permitted, including adoption during an interim period. The Company early adopted this update for the interim period ended September 30, 2017 as the treatment of debt extinguishment payments as a financing activity more clearly presents the cash outflow of the extinguishment transaction. The adoption of ASU 2016-15 resulted in classification of cash payments related to a debt prepayment as cash outflows for financing activities. Additional information concerning the prepayment of the Loan Agreement is discussed further in Note 11 included in the

CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

Company’s Annual Report on Form 10-K for the year ended December 31, 2017 filed with the Securities and Exchange Commission on March 1, 2018.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows - Restricted Cash (Topic 230). This standard requires companies to include amounts generally described as restricted cash and restricted cash equivalents in cash and cash equivalents when reconciling beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The Company adopted this standard on January 1, 2018. The adoption of ASU 2016-18 resulted in the Company's cash, cash equivalents and restricted cash being included in the beginning and ending amounts for the periods shown on the statement of cash flows and was applied retroactively and reflected in the balances presented for any prior periods. The Company believes that the adoption of this guidance did not have a significant impact on its condensed consolidated financial statements and related disclosures.

The restricted cash as of June 30, 2018 and December 31, 2017 is held as collateral for stand-by letters of credit issued by the Company to its landlords in connection with the leases of the Company's Lexington, Massachusetts facilities.

Cash, cash equivalents and restricted cash consisted of the following:

	June 30, 2018	June 30, 2017
Cash and cash equivalents	$58,359	$27,591
Restricted cash	1,557	400
	$59,916	$27,991

In January 2016, the FASB issued ASU 2016-01, Recognition and Measurement of Financial Assets and Financial Liabilities, which revises the classification and measurement of investments in equity securities. ASU 2016-01 generally requires that equity investments, except for those accounted for under the equity method of accounting, be measured at fair value and changes in fair value are recognized in net income. Effective January 1, 2018, the Company prospectively adopted this new standard resulting in the recognition of the effects of changes in fair value of equity securities within net income (loss) in the condensed consolidated statement of operations and comprehensive loss. Refer to Note 4 for discussion of the Company's marketable equity securities holdings.
Pending Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842). ASU 2016-02 requires lessees to recognize assets and liabilities on the balance sheet for the rights and obligations created by all leases with terms of more than 12 months. ASU 2016-02 also will require certain qualitative and quantitative disclosures designed to give financial statement users information on the amount, timing, and uncertainty of cash flows arising from leases. ASU 2016-02 will be effective for the Company on January 1, 2019. The Company is currently evaluating the effect of adopting the requirements of ASU 2016-02 as it relates to the accounting for its facility lease at 65 Hayden Avenue, Lexington, Massachusetts, which was executed in December 2017 and is discussed further in Note 10. The Company is also currently evaluating other contracts to determine if any contain embedded leases. The Company's lease for its 99 Hayden Avenue, Lexington, Massachusetts facility expires in September 2018 and as a result will not be evaluated under the scope of ASU 2016-02.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments-Credit Losses (Topic 326)-Measurement of Credit Losses on Financial Instruments. The new standard requires entities to measure all expected credit losses for financial assets held at the reporting date based on historical experience, current conditions and reasonable and

supportable forecasts. ASU 2016-13 will become effective for the Company for fiscal years beginning after December 15, 2019, with early adoption permitted. The Company is currently evaluating the impact ASU 2016-13 will have on its financial statements and related disclosures.

In June 2018, the FASB issued ASU 2018-07 (Topic 718) - Improvements to Nonemployee Share-Based Payment Accounting that expands the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. An entity should apply the requirements of Topic 718 to nonemployee awards except for certain exemptions specified in the amendment. The guidance is effective for fiscal years beginning after December 15, 2018, including interim reporting periods within that fiscal year. Early adoption is permitted, but no earlier than an entity’s adoption date of Topic 606. The Company believes that this guidance will not have a significant impact on its condensed consolidated financial statements and related disclosures.

CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

3. Fair Value Measurements

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

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

The tables below present information about the Company's financial assets and liabilities that are measured and carried at fair value as of June 30, 2018 and December 31, 2017 (in thousands) and indicate the level within the fair value hierarchy where each measurement is classified.

	Level 1	Level 2	Level 3	Total
June 30, 2018				
Cash equivalents:				
Money market funds	$51,295	$—	$ —	$51,295
Investments, available for sale:				
U.S. Treasury obligations	34,422	—	—	34,422
Government agency securities	47,426	40,140	—	87,566
Marketable equity securities:				
Corporate equity securities (Note 7)	9,824	—	—	9,824
Total	$142,967	$40,140	$ —	$183,107

	Level 1	Level 2	Level 3	Total
December 31, 2017				
Cash equivalents:				
Money market funds	$8,108	$—	$ —	$8,108
Investments, available for sale:				
U.S. Treasury obligations	53,910	—	—	53,910
Government agency securities	88,651	32,939	—	121,590
Total	$150,669	$32,939	$ —	$183,608

4. Cash, Cash Equivalents, Investments and Marketable Equity Securities

Cash equivalents include all highly liquid investments maturing within 90 days from the date of purchase. Investments consist of securities with original maturities greater than 90 days when purchased. The Company classifies these investments as available-for-sale and records them at fair value in the accompanying consolidated balance sheets. In accordance with ASU 2016-01, unrealized gains or losses from equity securities are included in net income. Unrealized gains or losses from other investments, including debt securities, are included in accumulated other comprehensive income (loss). Premiums or discounts from par value are amortized to investment income over the life of the underlying investment.

Cash, cash equivalents, available for sale investments, and marketable equity securities included the following at June 30, 2018 and December 31, 2017:

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CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

	Average maturity	Amortized cost	Unrealized gains	Unrealized losses	Fair value
June 30, 2018					
Cash		$7,064	$ —	$ —	$7,064
Money market funds		51,295	—	—	51,295
Cash and cash equivalents		$58,359	$ —	$ —	$58,359
U.S. Treasury obligations	109 days	34,470	—	(48)	34,422
Government agency securities	169 days	87,846	—	(280)	87,566
Investments, available for sale		$122,316	$ —	$ (328)	$121,988
Marketable equity securities (Note 7)		$10,451	$ —	$ (627)	$9,824

	Average maturity	Amortized cost	Unrealized gains	Unrealized losses	Fair value
December 31, 2017					
Cash		$19,557	$ —	$ —	$19,557
Money market funds		8,108	—	—	8,108
Cash and cash equivalents		$27,665	$ —	$ —	$27,665
U.S. Treasury obligations	184 days	54,004	—	(94)	53,910
Government agency securities	229 days	121,903	—	(313)	121,590
Investments, available for sale		$175,907	$ —	$ (407)	$175,500

Although available to be sold to meet operating needs or otherwise (and therefore classified as current assets), securities are generally held through maturity. The cost of securities sold is determined based on the specific identification method for purposes of recording realized gains and losses. During 2018 and 2017, there were no realized gains or losses on sales of investments, and no investments were adjusted for other than temporary declines in fair value.

5. Accrued Expenses and Other Liabilities

Accrued expenses and other liabilities consisted of the following:

	June 30, 2018	December 31, 2017
Accrued professional fees and other	$1,076	$ 628
Employee compensation and benefits	1,286	2,797
Research and development expenses	454	521
Deferred lease incentive, current portion	538	249
Deferred rent, current portion	35	104
	$3,389	$ 4,299

6. Income Taxes

Deferred tax assets and deferred tax liabilities are recognized based on temporary differences between the financial reporting and tax basis of assets and liabilities using statutory rates. A valuation allowance is recorded against deferred tax assets if it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company's ability to use its operating loss carryforwards and tax credits to offset future taxable income is subject to restrictions under Sections 382 and 383 of the United States Internal Revenue Code (the "Internal Revenue Code"). Net operating loss and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative

CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

changes in the ownership interest of significant shareholders over a three-year period in excess of 50 percent, as defined under Sections 382 and 383 of the Internal Revenue Code. Such changes would limit the Company's use of its operating loss carryforwards and tax credits. In such a situation, the Company may be required to pay income taxes, even though significant operating loss carryforwards and tax credits exist.

The Company records a provision or benefit for income taxes on ordinary pre-tax income or loss based on its estimated effective tax rate for the year. As of June 30, 2018, the Company forecasts an ordinary pre-tax loss for the year ended December 31, 2018 and, since it maintains a full valuation allowance on its deferred tax assets, the Company did not record an income tax benefit for the six month ended June 30, 2018. On July 25, 2017, the transaction contemplated by the Asset Purchase Agreement with Vertex, as discussed in Note 7, closed and Vertex paid the Company $160 million in cash consideration, with $16 million to be held in escrow. For income tax purposes, the $16 million held in escrow is recognized under the installment method and therefore deferred until the cash is received by the Company. Under the provisions of Section 453A of the Internal Revenue Code, the Company is required to recognize interest on the portion of the installment sale outstanding as of the close of each taxable year that exceeds $5 million. As a result, as of June 30, 2018 the Company recorded a provision of $0.3 million which includes $0.2 million of interest accrued for tax year 2017 and $0.1 million of interest accrued for the first six months of 2018.

In accordance with SAB 118, the Company's preliminary estimate of the effects of the Tax Cuts and Jobs Act, or TCJA, including the remeasurement of deferred tax assets and liabilities and the recognition of an income tax benefit related to AMT tax credit carryforwards, is subject to the finalization of management's analysis related to certain matters, such as developing interpretations of the provisions of the TCJA and the filing of its tax returns. During the six months ended June 30, 2018, no adjustments were recorded to the provisional amounts previously recorded. U.S. Treasury regulations, administrative interpretations or court decisions interpreting the TCJA may require further adjustments and changes in estimates. The final determination of the effects of the TCJA will be completed as additional information becomes available, but no later than one year from the enactment of the TCJA. In all cases, the Company will continue to make and refine its calculations as additional analysis is completed. In addition, the Company's estimates may also be affected as it gains a more thorough understanding of the tax law.

7. Revenue

The Company's revenue is currently generated through collaborative licensing agreements, patent assignments, and sales of intellectual property. The Company generates its revenue through one segment and the revenue recognized under each of the Company's arrangements during the current and prior period is described below. The terms of these agreements may contain multiple promised goods or services or optional goods and services, including licenses, or options to obtain licenses, to product candidates, referred to as exclusive licenses, as well as research and development activities to be performed by the Company on behalf of the collaboration partner related to the licensed product candidates.

Revenue recognition

Revenue is recognized when control of the promised goods or services are transferred to customers, in an amount that reflects the consideration the Company expects to be entitled to in exchange for transferring those goods or providing services. The Company accounts for a contract when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable.

When determining whether the customer has obtained control of the goods or services, the Company considers the point at which the customer may benefit from the goods or services. For licenses to product candidates, revenue is recognized upon grant or transfer of the exclusive license, as the Company's licenses are considered functional in

nature. For research, development, and manufacturing activities, revenue is recognized as the work is performed using either the output or input method.

Performance obligations

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC 606. A contract’s transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The Company's contracts may contain multiple performance obligations if a promise to transfer the individual goods or services is separately identifiable from other promises in the contracts and, therefore, is considered distinct. For contracts with multiple performance obligations, the Company determines the standalone selling price of each performance obligation and allocates the total transaction price using the relative selling

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NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

price basis. The Company recognizes performance obligations based on their nature, as discussed above in the revenue recognition section.

Options to exclusive licenses

The collaborative arrangement with Celgene provides the customer the option to purchase additional licenses in addition to preclinical and clinical development services at a discount. These options are considered performance obligations as they provide the customer with material rights that the customer would not receive without entering into the contract. The portion of the transaction price attributed to a material right is recognized when the underlying option is exercised or when the option expires. To date, Celgene has not exercised any of its options that were determined to represent material rights.

Significant Payment Terms

The Company’s revenue arrangements include payments to the Company of one or more of the following: a nonrefundable, upfront payment; milestone payments; payment of license exercise or option fees with respect to product candidates; fees for research and development services rendered; and royalties on commercial sales of licensed product candidates, if any. To date, the Company has received upfront payments, several milestone payments and certain research and development service payments but has not received any license exercise or option fees or earned royalty revenue as a result of product sales.

Under ASC 606, the Company estimates the amount of consideration to which it will be entitled in exchange for satisfying performance obligations. Based on the Company’s current contracts, variable consideration primarily exists in the following forms: development and regulatory milestones, royalties and sales-based milestones, and consideration held in escrow for indemnification purposes. The Company utilizes the "most likely amount" variable consideration method for estimating development and regulatory milestone consideration to include in the transaction price and the “expected value” variable consideration method for the consideration held in escrow for indemnification purposes. The Company only includes an amount of variable consideration in the transaction price to the extent it is probable that significant reversal in the cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. The Company refers to this as the variable consideration constraint. Due to the uncertainty associated with the occurrence of the underlying events which would trigger development and regulatory milestone consideration under its revenue arrangements, with the exception of those development and regulatory milestones received to date, the Company has concluded the variable consideration associated with all development and regulatory milestones to be fully constrained as of the ASC 606 transition date and as of June 30, 2018 and therefore has not included such consideration in the transaction price for any of its revenue arrangements. The Company will re-assess this conclusion at each subsequent reporting period and will only include amounts associated with regulatory or development milestones in the transaction price when, or if, the variable consideration is determined to be released from the constraint.

To date, the Company has not recognized any royalties under its licensing and collaboration arrangements. Royalties qualify for the sales-and-usage exemption under ASC 606 as (i) royalties are based strictly on the sales-and-usage by the licensee; and (ii) a license of IP is the sole or predominant item to which such royalties relate. Based on this exemption, these royalties are earned under the terms of a license agreement in the period the products are sold by the Company's collaborator and the Company has a present right to payment.

In accordance with ASC 606, the Company is required to adjust the transaction price for the effects of the time value of money if the timing of payments agreed to by the parties to the contract, explicitly or implicitly, provides the Company or its customer with a significant benefit of financing the transfer of goods or services. The Company concluded that its licensing and collaboration arrangements do not contain a significant financing component because the payment structure of its agreements arise from reasons other than providing a significant benefit of financing.

Application of Practical Expedients

The collaborative arrangements with Glaxo Group Limited, or GSK, and Jazz Pharmaceuticals contained contract modifications. The Company elected to apply the transition practical expedient under ASC 606-10-65-1(f)(4) that allows an entity to reflect the aggregate effect of all contract modifications on contracts that were modified before the beginning of the earliest period presented under the new standard (that is, January 1, 2018) when (i) identifying the satisfied and unsatisfied performance obligations, (ii) determining the transaction price, and (iii) allocating the transaction price to the satisfied and unsatisfied performance obligations. The application of the practical expedient did not have a material effect on the Company's revenue recognition.

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Contract Assets

As of January 1, 2018, the Company identified a contract asset of $16.0 million associated to the Vertex indemnification payment currently held in escrow. As the receipt of the Vertex indemnification consideration involves more than the passage of time, the consideration was concluded to be conditional and therefore classified as a contract asset. As of June 30, 2018, there have been no changes to the balance of the Company's contract asset from the date of adoption of ASC 606.

Contract Liabilities

As of January 1, 2018, the Company identified contract liabilities of $10.5 million related to unsatisfied performance obligations as well as variable consideration paid in advance but currently constrained from recognition. Contract liabilities are presented as deferred revenue and classified as current or noncurrent based on the timing of when the Company expects to recognize revenue. No deferred revenue was recognized into revenue during the three months ended June 30, 2018. During the six months ended June 30, 2018, $16 thousand of deferred revenue was recognized into revenue. As of June 30, 2018, the Company recorded $10.5 million of contract liabilities in the condensed consolidated statement of financial position.

Collaboration Arrangements

Celgene

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

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

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

As a result of the restrictions placed on the two additional license programs that preclude Celgene from exercising its rights under the respective licenses without the payment of a significant license exercise fee, for accounting purposes the Company concluded that it had effectively provided Celgene an option to obtain licenses to those programs.

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

The Company does 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 the applicable exercise fee. If Celgene exercises its rights with respect to any additional program and pays the Company the applicable exercise fee, the Company is responsible, at its own expense, for conducting research and development activities for such program pursuant to agreed-upon development plans until the completion of 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 the Company the applicable option exercise fee, the Company is responsible for seeking to generate a deuterated compound for clinical development in the selected option program. Oversight of

the development program for each program under the Celgene Agreement is guided by separate JSCs.
Celgene is solely responsible for all research, development and commercialization costs with respect to the initial program beyond the Phase 1 clinical trials that the Company conducts. 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.

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

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

Under ASC 606, the Company's collaborative arrangement with Celgene contains the following performance obligations: (i) an exclusive worldwide license to develop, manufacture and commercialize deuterated analogs of apremilast related to the CTP-730 program, or the License Performance Obligation, (ii) obligations to perform research and development services associated with the CTP-730 program, or the R&D Services Performance Obligation, (iii) obligation to supply nonclinical and clinical trial material related to the CTP-730 program, or the Supply Performance Obligation, (iv) material right related to the first additional license program for which the non-deuterated compound has been selected, or the First Discount Performance Obligation and (v) material right related to the second additional license program for which the non-deuterated compound has been selected, or the Second Discount Performance Obligation.

The transaction price as of the transition date consisted of the $35.0 million non-refundable upfront payment and the $8.0 million milestone payment received upon successful completion of the Phase 1 clinical program totaling to $43.0 million. The Company allocated the upfront arrangement consideration of $35.0 million among the performance obligations using the relative selling price method based on the standalone selling prices of each performance obligation, which is generally the price at which it would sell such deliverable if it were to be sold regularly on a standalone basis. The standalone selling price of License Performance Obligation was based on historical valuations for other licensing arrangements entered into by the Company. The standalone selling prices of the R&D Services Performance Obligation and the Supply Performance Obligation were based on the expected cost plus margin approach. The standalone selling prices of the First and Second Discount Performance Obligations were based the expected value of the options.

The Company allocated the $8.0 million milestone payment to only the License Performance Obligation, R&D Services Performance Obligation and the Supply Performance Obligation using the relative selling price method based on the standalone selling prices of each of these three performance obligations. The Company concluded that the achievement of the performance-based milestone for the CTP-730 program should only be allocated to the performance obligations associated to the CTP-730 program as the achievement of the milestone related specifically to the Company’s efforts with respect to the satisfaction of the performance obligations related to that program. The

transaction price was allocated as follows: (i) $21.7 million to the License Performance Obligation, (ii) $11.0 million to the R&D Services Performance Obligation, (iii) $4.0 million to the Supply Performance Obligation, (iv) $3.2 million to the First Discount Performance Obligation and (v) $3.2 million to the Second Discount Performance Obligation.

Revenue is recognized when the performance obligation is considered satisfied. The License Performance Obligation was considered satisfied at contract inception as the exclusive license transferred control to the customer at this point in time. The R&D Services Performance Obligation and the Supply Performance Obligation are satisfied over time using the input method based on costs incurred determined by estimates of associated effort and cost of services adjusted for a reasonable profit margin such that they represent estimated market rates for similar services on a standalone basis. The First Discount Performance Obligation and the Second Discount Performance Obligation shall be considered satisfied upon the option's exercise or

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expiration. Unsatisfied performance obligations represent contract liabilities that are presented as deferred revenue within the accompanying condensed consolidated balance sheet.

The collaborative arrangement with Celgene contains consideration that is variable based on the customer's achievement of certain development, regulatory, and sales-based milestones in addition to royalties upon the customer's commercial success with licensed programs. The next milestone payment of $15.0 million upon first actual dosing in a Phase 3 clinical trial, or if earlier, acceptance for filing of a new drug application, or NDA, for the CTP-730 program is considered variable consideration that is fully constrained due to the uncertainty associated to the achievement of the milestone. The consideration related to royalty and sales-based milestones are also considered variable consideration that is fully constrained in accordance with the royalty recognition constraint. As a result, the variable consideration that is considered fully constrained related to milestones will not be recognized until the time at which the constraint is released. The variable consideration related to royalties will be recognized in the period the products are sold by Celgene and the Company has a present right to payment.

During the three months ended June 30, 2018 and June 30, 2017, the Company recognized no revenue for the R&D Services and Supply Performance Obligations as no services were performed. During the six months ended June 30, 2018, the Company recognized $16 thousand for the R&D Services and Supply Performance Obligations, as compared to the $21 thousand recognized during the six months ended June 30, 2017. The revenue in the prior year period was recognized in accordance with legacy authoritative guidance. The revenue was classified as license and research and development revenue in the accompanying condensed consolidated statements of operations and comprehensive loss.

As of June 30, 2018, there was $7.8 million of deferred revenue related to the Company’s collaboration with Celgene, consisting of $1.3 million related to the R&D Services Performance Obligation, $0.1 million related to the Supply Performance Obligation and $6.4 million related to the First and Second Discount Performance Obligations. The Company classified the $1.4 million related to the R&D Services Performance Obligation and the Supply Performance Obligation as a current liability and the $6.4 million related to the First and Second Discount Performance Obligations as a noncurrent liability in the accompanying condensed consolidated balance sheet.

Avanir

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

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

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

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

licensed product in the particular country.

The Company determined that all promised goods and services related to the arrangement with Avanir were considered satisfied as of the ASC 606 adoption date of January 1, 2018.

The transaction price consists of the $2.0 million non-refundable upfront payment and $6.0 in development milestone payments received totaling to $8.0 million. As all promised goods and services were considered satisfied as of the ASC 606 adoption

date, the arrangement consideration need not be allocated among the performance obligations because the arrangement consideration was fully recognized as of January 1, 2018.

The arrangement with Avanir contains consideration that is variable based on the customer's achievement of certain development, regulatory, and sales-based milestones in addition to royalties upon the customer's commercial success with the licensed product. The $6.0 million resulting from the achievement of development milestones represents variable consideration that has been earned and therefore is not subject to constraint. The next milestones that the Company may be entitled to are regulatory milestones that represent variable consideration that is fully constrained due to the uncertainty associated to the achievement of milestones of this nature. The variable consideration related to royalties will be recognized in the period the products are sold by Avanir and the Company has a present right to payment.

Jazz Pharmaceuticals

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

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

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

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

The Company determined that all promised goods and services related to the collaborative arrangement with Jazz Pharmaceuticals were considered satisfied as of the ASC 606 adoption date of January 1, 2018.

The transaction price consists of the $4.0 million non-refundable upfront payment. As all promised goods and services were considered satisfied as of the ASC 606 adoption date, the arrangement consideration need not be allocated among the performance obligations. Furthermore, as all promised goods and services are considered satisfied, the consideration was fully recognized as of January 1, 2018.

The collaborative arrangement with Jazz Pharmaceuticals contains consideration that is variable based on the customer's achievement of certain development, regulatory, and sales-based milestones in addition to royalties upon the customer's commercial success with the licensed product. The next milestone payment the Company may be entitled to receive of $4.0 million related to initiation of the first Phase 2 clinical trial of JZP-386 is considered variable consideration that is fully constrained due to the uncertainty associated to the achievement of the development milestone. The consideration related to royalty and sales-based milestones are also considered variable consideration that is fully constrained in accordance with the royalty recognition constraint. The variable consideration related to royalties will be recognized in the period the products are sold by Jazz and the Company has a

present right to payment.

For the three and six months ended June 30, 2018, the Company did not recognize revenue as compared to $15 thousand and $22 thousand for the three and six months ended June 30, 2017, respectively, related to the performance of development support services. The revenue in the prior year period was recognized in accordance with legacy authoritative guidance.

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Other Revenue Arrangements

Vertex

On March 3, 2017, the Company and Vertex entered into an Asset Purchase Agreement pursuant to which, subject to the satisfaction or waiver of the conditions therein, the Company sold and assigned to Vertex, CTP-656, a deuterated analog of ivacaftor now known as VX-561, and other cystic fibrosis assets of the Company. On July 25, 2017, the Closing Date, the transaction contemplated by the Asset Purchase Agreement closed and Vertex paid the Company $160 million in cash consideration, with $16 million to be held in escrow. There are no refund provisions with the exception of the amount held in escrow for potential indemnification for a period of eighteen months. Additionally, upon the achievement of certain milestone events, Vertex has agreed to pay the Company an aggregate of up to $90 million. Of this amount, $50 million will become payable to the Company upon receipt of FDA marketing approval for a combination treatment regimen containing VX-561, for patients with cystic fibrosis, and $40 million will become payable to the Company upon completion of a pricing and reimbursement agreement in the first of the United Kingdom, Germany or France with respect to a combination treatment regimen containing VX-561 for patients with cystic fibrosis.

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

The Asset Purchase Agreement with Vertex contains a single performance obligation: all rights to develop, manufacture, and commercialize deuterated analogs of ivacaftor related to the CTP-656 program, including all intellectual property, permits and registrations, and records, documentation, and regulatory filings, in addition to an obligation to perform research and testing consulting services to facilitate the transfer of materials, documents, and knowledge up to the close of the Asset Purchase Agreement, referred to as the Transfer of IP Performance Obligation.

The Asset Purchase Agreement with Vertex contains consideration that is variable based on Vertex's achievement of certain regulatory milestones in addition to the $16.0 million held in escrow to indemnify Vertex. The regulatory milestone payments are considered variable consideration that are fully constrained due to the uncertainty associated to the achievement of the respective milestones. The Company concluded that an indemnification claim was remote and as a result was not subject to the variable consideration constraint at the ASC 606 transition date. Accordingly, the variable consideration of $16.0 million was included in the transaction price.

The transaction price was $160.0 million, as the variable consideration associated with the escrow amount was not subject to the constraint. As the arrangement contained a single performance obligation, the Company attributed the full transaction price to the Transfer of IP Performance Obligation.

The Transfer of IP Performance Obligation was satisfied as of the Closing Date as the control of CTP-656 transferred to Vertex, the customer. As a result, the full transaction price was recognized as revenue as of the ASC 606 adoption date.

The Vertex indemnification variable consideration represents a contract asset to be released from escrow 18 months following the Closing Date assuming no indemnity claims by Vertex. As of June 30, 2018, there was $16.0 million in contract assets classified as current assets in the accompanying condensed consolidated balance sheet.

GSK

In May 2009, the Company entered into a research and development collaboration and license agreement with GSK to research, develop and commercialize multiple products containing deuterated compounds, including CTP-499. The

agreement with GSK, as subsequently amended, expired in May 2012 after GSK opted out of further development under the agreement and made a $2.8 million payment to the Company. The Company has an obligation to make a payment to GSK of up to $2.8 million if the Company commercializes CTP-499 or if the Company receives cash proceeds from re-licensing or transferring the rights to the CTP-499 program.

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Under the new revenue standard, the $2.8 million payment represents variable consideration that is fully constrained as of the ASC 606 adoption date due to the likelihood the Company may be required to repay GSK as a result of the transaction contemplated by the License and Option Agreement with Promet Therapeutics, LLC, discussed further in this Note 7. The $2.8 million payment is a contract liability that is classified as deferred revenue as of June 30, 2018 and will not be recognized as revenue until the repayment obligation lapses.

Auspex

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

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

The Company determined that all performance obligations in the patent assignment agreement have been satisfied as of the ASC 606 adoption date of January 1, 2018.

Allocable arrangement consideration as of the ASC 606 adoption date was limited to the transaction price consisting of the one-time change of control payment of $50.2 million. As all promised goods and services in the arrangement were considered satisfied as of the ASC 606 adoption date, the arrangement consideration need not be allocated among the performance obligations because the arrangement consideration was fully recognized as of January 1, 2018.

The arrangement with Auspex contains consideration that is variable in the amount including the potential royalties that may be due upon the commercial success of deuterated pirfenidone products. The $50.2 million resulting from the change of control payment represents variable consideration that has been received and therefore is not subject to constraint. The Company determined that the sales-and-usage royalty exemption under ASC 606 is not applicable as the Company assigned the intellectual property to Auspex, rather than enter into a license transaction. Accordingly, the consideration related to potential royalties represents variable consideration that is fully constrained due to the significant level of uncertainty related to the development prospects of the assigned patent. As a result, the consideration related to potential royalties will not be recognized until the time at which the constraint is released.

Processa

On October 4, 2017, the Company entered into a License and Option Agreement, or the Option, with Promet Therapeutics, LLC, or Promet, pursuant to which the Company granted Promet an option to obtain an exclusive license to CTP-499, a deuterated analog of 1-(S)-5-hydroxyhexyl-3,7-dimethylxanthine, or HDX, an active metabolite of pentoxifylline, provided certain conditions were met. On October 5, 2017, Promet closed an asset purchase agreement with Heatwurx, Inc., a public company, creating Processa Pharmaceuticals, Inc., or Processa.

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On March 21, 2018, the Company entered into an Amendment to the Option, or Amendment, and a Securities Purchase Agreement, or Securities Agreement, both with Promet and Processa. Pursuant to the Amendment, the Company granted Promet, who then assigned to Processa, an exclusive, worldwide, royalty-bearing license to develop, manufacture and commercialize CTP-499. Upon transfer of the license and as consideration for the license, the Company received 2,090,301 shares of common stock of Processa, representing approximately 5.9% of the common stock outstanding.

The Company is also eligible to receive royalties on worldwide net sales.

The Amendment contained one performance obligation: an exclusive, worldwide, royalty-bearing license to develop, commercialize and sublicense CTP-499. The Company determined that the transaction price was $10.5 million, which was based on the fair value of the noncash consideration received on March 19, 2018, which consisted of 2,090,301 shares of publicly traded common stock of Processa. The transaction price of $10.5 million was allocated to the single performance obligation. The performance obligation was considered satisfied at contract inception as the exclusive license transferred control to the customer at this point in time. Accordingly, revenue of $10.5 million was recognized during the first quarter of 2018.

Subsequent changes to the fair value of the underlying securities is recognized as unrealized gains or losses on marketable equity securities within the condensed consolidated statement of operations and comprehensive income (loss).
The Amendment contains consideration that is variable based on royalties upon the customer's commercial success with the licensed product. The consideration related to royalty payments is considered variable consideration that is fully constrained in accordance with the royalty recognition constraint. The variable consideration related to royalties will be recognized in the period the products are sold by Processa and the Company has a present right to payment.

As of June 30, 2018, the Company recognized $10.5 million in revenue related to the transfer of the license.

8. Stock-Based Compensation
The Company’s equity incentive plans provide for the issuance of a variety of stock-based awards, including incentive stock options, nonstatutory stock options and awards of stock, to directors, officers and employees of the Company, as well as consultants and advisors to the Company. As of June 30, 2018, the Company has granted awards in the form of stock options and restricted stock units (the "RSUs"). The stock options generally have been granted with an exercise price equal to the fair value of the underlying common stock on the date of grant, a vesting period of three or four years, and all options expire no later than ten years from the date of grant.
Effective January 1, 2018, an additional 925,615 shares were added to the Company’s 2014 Stock Incentive Plan (the "2014 Plan"), for future issuance pursuant to the terms of the 2014 Plan. As of June 30, 2018, there were 1,356,655 shares of common stock available for future award grants under the 2014 Plan.
Total stock-based compensation expense related to all stock-based options and awards recognized in the condensed consolidated statements of operations and comprehensive loss consisted of:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
Research and development	$ 1,274	$ 686	$2,801	$1,403
General and administrative	1,530	887	3,302	1,813
Total stock-based compensation expense	$ 2,804	$ 1,573	$6,103	$3,216

Stock Options

Stock options are valued using the Black-Scholes-Merton option valuation model and compensation cost is recognized based on such fair value over the period of vesting. The weighted average fair value of options granted in the three and six months ended June 30, 2018 and 2017 reflect the following weighted-average assumptions:

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	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
Expected volatility	77.10 %	78.30 %	77.17 %	78.16 %
Expected term	6.0 years	6.0 years	6.0 years	6.0 years
Risk-free interest rate	2.77 %	2.02 %	2.64 %	2.07 %
Expected dividend yield	— %	— %	— %	— %

For the three and six months ended June 30, 2018 and 2017, expected volatility was estimated using a weighted-average of the Company's historical volatility of its common stock and the historical volatility of the common stock of a group of similar companies that were publicly traded. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

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

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(in thousands, except per share data)			
Weighted average fair value of options granted, per option	$13.38	$9.29	$18.14	$7.66
Aggregate grant date fair value of options vested during the period	$2,268	$1,691	$3,729	$2,967
Total cash received from exercises of stock options	$242	$317	$911	$1,456
Total intrinsic value of stock options exercised	$243	$645	$2,352	$3,309

The following is a summary of stock option activity for the six months ended June 30, 2018:

	Number of Option Shares	Weighted Average Exercise Price per Share	Weighted Average Remaining Contractual Term (In years)	Aggregate Intrinsic Value (In thousands)
Outstanding at December 31, 2017	2,889,722	$ 11.25		
Granted	921,343	$ 26.61		
Exercised	(169,911)	$ 7.43		
Forfeited or expired	(19,877)	$ 18.13		
Outstanding at June 30, 2018	3,621,277	$ 15.30	7.38	$ 14,543
Exercisable at June 30, 2018	1,825,536	$ 11.21	6.26	$ 10,766
Vested and expected to vest at June 30, 2018[1]	3,457,648	$ 15.04	7.32	$ 14,230

(1) This represents the number of vested stock option shares as of June 30, 2018, plus the number of unvested stock option shares that the Company estimated as of June 30, 2018 would vest, based on the unvested stock option shares at June 30, 2018 and an estimated forfeiture rate of 7%.

As of June 30, 2018, there was $21.1 million of unrecognized compensation cost related to stock options that are expected to vest. The stock option costs are expected to be recognized over a weighted average remaining vesting period of 2.6 years.

Restricted Stock Units

On July 6, 2017, the Company granted 0.5 million restricted stock units, or RSUs, to executives and employees. The awards granted to employees are service-based, whereas the awards granted to executives are a blend of service-based and performance-based. Assuming all service and performance conditions were achieved, fifty percent of the RSUs would vest on

CONCERT PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

March 31, 2018, and the remaining fifty percent of the RSUs will vest on March 31, 2019. Certain executive awards were subject to the achievement of defined performance criteria prior to March 31, 2018, including the closing of the Asset Purchase Agreement with Vertex Pharmaceuticals, Inc. and the institution by the Patent Trial and Appeal Board ("PTAB") of the Post Grant Review ("PGR") petition filed by the Company against Incyte Corporation. In January 2018, the PTAB decided not to institute the PGR petition and, as a result, the corresponding performance-based awards did not vest on March 31, 2018.

The Company is using the accelerated attribution method to recognize expense over the required service period based on its estimate of the number of performance-based awards that will vest. If there is a change in the estimate of the number of performance-based awards that are probable of vesting, the Company will cumulatively adjust compensation expense in the period that the change in estimate is made.

RSUs are not included in issued and outstanding common stock until the shares are vested and released. As of June 30, 2018, 174,050 RSUs had vested. The fair value of an RSU is measured based on the market price of the underlying common stock as of the date of grant, reduced by the purchase price of $0.001 per share.
The following is a summary of RSU activity, including both service-based and performance-based RSUs for the six months ended June 30, 2018:

	Number of RSU Shares	Weighted Average Grant Date Fair Value
Outstanding at December 31, 2017	517,300	$ 13.87
Granted	—	$ —
Released	(174,050)	$ 13.87
Forfeited	(114,700)	$ 13.87
Outstanding at June 30, 2018	228,550	$ 13.87

As of June 30, 2018, there was $1.8 million of unrecognized compensation cost related to RSUs that are expected to vest. This amount excludes compensation cost related to RSUs where the performance conditions are not considered probable of being satisfied. The costs from RSUs likely to vest are expected to be recognized over a weighted average remaining vesting period of 0.8 years.

9. Earnings (Loss) Per Share
Basic net earnings (loss) per common share is calculated by dividing net earnings (loss) allocable to common stockholders by the weighted-average common shares outstanding during the period, without consideration of common stock equivalents. Diluted net earnings per share is calculated by adjusting the weighted-average shares outstanding for the dilutive effect of common stock equivalents, including stock options and warrants, outstanding for the period as determined using the treasury stock method. For purposes of the diluted net loss per share calculation, common stock equivalents are excluded from the calculation because their effect would be anti-dilutive. Therefore, basic and diluted net loss per share applicable to common stockholders is the same for periods with a net loss.
The following table illustrates the determination of loss per share for each period presented.

CONCERT PHARMACEUTICALS, INC.
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	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
	(in thousands, expect per share amounts)			
Numerator:				
Net loss applicable to common stockholders - basic and diluted	$(13,325)	$(13,027)	$(17,788)	$(26,360)
Denominator:				
Weighted average shares outstanding - basic	23,402	22,579	23,313	22,479
Dilutive stock options	—	—	—	—
Dilutive warrants	—	—	—	—
Weighted average shares outstanding - diluted	23,402	22,579	23,313	22,479
Net loss per share applicable to common stockholders - basic and diluted	$(0.57)	$(0.58)	$(0.76)	$(1.17)
Anti-dilutive potential common stock equivalents excluded from the calculation of net loss per share:				
Stock options	786	637	880	610
Stock awards	140	—	254	—
Warrants	132	132	132	132

10. Commitments

In December 2017, the Company entered into an agreement to lease approximately 55,500 square feet of office and laboratory space in a new location at 65 Hayden Avenue, Lexington, Massachusetts (the "Premises"). The Company expects to relocate its operations to the Premises in the third quarter of 2018 prior to the expiration of the lease agreement for its current office and laboratory space on September 30, 2018. For additional details related to the lease agreement, refer to Note 11 in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017, which was filed with the Securities and Exchange Commission on March 1, 2018.

The Company began recognizing rent expense relating to 65 Hayden Avenue on a straight line basis beginning on January 1, 2018, which was determined to be the lease commencement date. The Company recognized $1.4 million in rent expense relating to this property during the six months ended June 30, 2018.

The Company's lease agreement calls for a tenant improvement allowance of $5.0 million for certain permitted costs related to the design and construction of Company improvements to the Premises. The Company is accounting for the tenant improvements as a lease incentive obligation to be amortized against operating lease expense on a straight-line basis over the term of the Lease. The leasehold improvements will be recognized as assets and amortized on a straight-line basis over the term of the Lease. The Company recorded leasehold improvement assets and a corresponding lease incentive obligation of $4.2 million for design and construction improvements completed during the six month period ended June 30, 2018. The lease incentive of $5.0 million is being amortized over the lease term on a straight line basis beginning on January 1, 2018, or the lease commencement date.

Item 2. 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 condensed consolidated financial statements and the related notes appearing elsewhere in this Quarterly Report on Form 10-Q. Statements contained or incorporated by reference in this Quarterly Report on Form 10-Q that are not based on historical fact are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These forward-looking statements regarding future events and our future results are based on current expectations, estimates, projections, intentions, goals, strategies, plans, prospects and the beliefs and assumptions of our management including, without limitation, our expectations regarding results of operations, general and administrative expenses, research and development expenses, current and future development and manufacturing efforts, regulatory filings, nonclinical and clinical trial results, and the sufficiency of our cash for future operations. You should read the "Risk Factors" section in Part II—Item 1A. of this report for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

OVERVIEW

We are a clinical stage biopharmaceutical company applying our extensive knowledge of deuterium chemistry to discover and develop novel small molecule drugs. Selective incorporation of deuterium into known molecules has the potential, on a case-by-case basis, to provide better pharmacokinetic or metabolic properties, thereby enhancing their clinical safety, tolerability or efficacy. Our approach typically starts with previously studied compounds, including approved drugs, which we believe may be improved with deuterium substitution. Our technology provides the opportunity to develop products that may compete with the non-deuterated drug in existing markets or to leverage its known activity to expand into new indications and may enable compounds not otherwise well-suited for human drug development to be clinically developed. Our deuterated chemical entity platform, or DCE Platform®, has broad potential across numerous therapeutic areas. We have a pipeline of clinical candidates as well as research efforts to identify new product candidates.

CTP-543

Background on Alopecia Areata

Alopecia areata is a chronic autoimmune disease affecting approximately 650,000 Americans at any given time that results in partial or complete loss of hair on the scalp and/or body. Alopecia areata occurs when the immune system attacks the hair follicles and is characterized as non-scarring hair loss. It presents in a number of patterns including:

- Patchy: coin-sized or larger patch or patches of hair loss;
- Totalis: no hair on the head; and
- Universalis: no hair anywhere on the body.

Onset can occur at any age including childhood, and it affects both women and men equally. While the average age of onset is between 25-35 years, the disease does occur in children, and onset in the first two decades is associated with more severe disease. The emotional effect of alopecia areata can be considerable and may result in anxiety and depression or affect personal attributes like self-esteem and confidence. Alopecia areata may also be associated with other autoimmune conditions such as thyroid disease, vitiligo, allergic rhinitis, asthma, lupus, rheumatoid arthritis, and ulcerative colitis. The most common form of treatment is corticosteroids including intralesional injections or topical application. However they often are not an effective treatment option. There are currently no FDA-approved treatments for alopecia areata.

CTP-543 Opportunity

CTP-543 was discovered by applying Concert's deuterium chemistry technology to modify ruxolitinib, a Janus kinase ("JAK") inhibitor, which is commercially available under the name Jakafi® in the United States for the treatment of certain blood disorders. Ruxolitinib has been used to treat alopecia areata in academic settings, including an investigator-sponsored clinical trial, and has been shown to promote hair growth in individuals with moderate-to-severe disease. In an open-label clinical trial of 12 patients with moderate to severe alopecia areata, investigators at Columbia University demonstrated that 20 mg of ruxolitinib administered orally twice daily resulted in 9 of 12 patients achieving at least 50% regrowth by the end of the treatment period. Responders averaged 92% regrowth by the end of the treatment period.

In January 2018, we announced that the FDA had granted Fast Track designation to CTP-543 for the treatment of alopecia areata.

Clinical Development of CTP-543

In 2016, we completed single and multiple ascending dose Phase 1 trials with CTP-543 which enrolled a total of 77 healthy volunteers. The pharmacokinetic measurements showed increased exposure with increasing doses of CTP-543. CTP-543 was well-tolerated across all dose groups and there were no serious adverse events reported in subjects who received CTP-543. In the multiple ascending dose Phase 1 trial of CTP-543, pharmacodynamic analyses were performed to assess the inhibition of IL-6- and IFN-gamma-mediated JAK/STAT signaling. Consistent with the expected pharmacological activity of a JAK1/JAK2 inhibitor, CTP-543 demonstrated a dose-related reduction of IL-6-stimulated phosphorylation of STAT3 in an ex-vivo assay. Also, IFN-gamma-mediated STAT1 signaling, which is believed to play a key role in the pathogenesis of alopecia areata, was significantly inhibited in disease-relevant immune cell types at all doses evaluated.

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

A Phase 2a trial to evaluate two sequential doses of CTP-543 (4 and 8 mg twice daily) and a placebo control is ongoing. In April 2018, we announced that patient enrollment in the Phase 2a study was complete. Approximately 90 patients with moderate-to-severe alopecia areata were randomized in the study. The primary outcome measure of the Phase 2a trial is the proportion of patients achieving at least 50% relative reduction in hair loss as measured by the severity of alopecia tool (SALT) score from baseline at Week 24. If appropriate, the protocol may be amended to explore a 12 mg twice daily dose of CTP-543. We expect to announce topline data for the 4 mg and 8 mg cohorts in the fourth quarter of 2018.

CTP-692

Background on Schizophrenia

Schizophrenia is a chronic and devastating neuropsychiatric disorder that is ranked as a leading cause of disability worldwide. The disease afflicts nearly 1% of the world’s population, affecting both men and women equally, and striking all ethnic and socioeconomic groups with a similar level of prevalence. The illness is characterized by multiple symptoms that are categorized into three clusters known as positive symptoms (hallucinations and delusional behaviors), negative symptoms (anhedonia, social withdrawal and apathy), and cognitive dysfunction (diminished

capacity for learning, memory, and executive function). The underlying basis of the current antipsychotic therapy is that excessive dopaminergic neurotransmission and dysfunctional D2 receptor signaling plays a key pathophysiological role in the disease, and consequently all typical and atypical antipsychotics in clinical practice possess some level of D2 antagonist activity. Currently available antipsychotic drugs exhibit efficacy for positive symptoms, but have been limited in their capacity to treat negative symptoms and cognitive deficits.

There is an extensive body of evidence supporting N-methyl-d-aspartate, or NMDA, receptor hypofunction as a key underlying mechanism of schizophrenia. The NMDA receptor comprises two binding domains and, in addition to requiring glutamate binding, activation with a co-agonist such as D-serine or glycine is necessary for NMDA receptor activation. D-serine is the most important human NMDA synaptic co-agonist. It has been postulated for some time that administration of NMDA co-agonists could benefit patients with schizophrenia since there is evidence that plasma and cerebral spinal fluid, or CSF, levels of endogenous D-serine are reduced in patients with schizophrenia. In addition, higher activity of the D-serine-metabolizing enzyme D-amino acid oxidase has been reported in post-mortem brain tissue of patients with schizophrenia than in normal individuals.

CTP-692 Opportunity

CTP-692 is a selective deuterium-modified analog of the endogenous amino acid, D-serine. Based on published preclinical and clinical effects of D-serine, the Company believes that CTP-692 has the potential to help restore NMDA receptor activity in key areas of the brain to improve clinical outcomes in patients with schizophrenia. Clinical studies have shown that levels of D-serine measured in the plasma and CSF of patients with schizophrenia are significantly lower than healthy controls. Academic studies have demonstrated that oral dosing of D-serine can result in dose-dependent improvement in positive, negative, and cognitive symptoms in patients with schizophrenia when added to D2 antipsychotics. However, preclinical studies have demonstrated that D-serine can cause nephrotoxicity in rats. In addition, in some patients who received high doses of D-serine, clinical findings suggesting renal impairment were observed. As a result, the clinical development of D-serine has historically been limited.

In preclinical studies, CTP-692 has shown clear dose separation from D-serine in causing increased levels of serum creatinine and blood urea nitrogen, suggesting that CTP-692 could have a larger therapeutic window. CTP-692 also provides greater exposure than doses of D-serine. It therefore may be better-suited for development as a human therapeutic agent. CTP-692 will be developed as an adjunctive therapy along with standard antipsychotic medicines in patients with schizophrenia. Based on previous clinical studies of D-serine in patients with schizophrenia and other neurological diseases, Concert has designed CTP-692 to have similar pharmacology to D-serine and potentially improve upon its safety profile.

The Company intends to complete preclinical evaluation and advance CTP-692 into clinical development in 2018.

Preclinical Pipeline

We are currently assessing a number of preclinical assets as potential development candidates.

COLLABORATION PRODUCT CANDIDATES

We have several collaborative arrangements with companies to develop deuterium-modified versions of their marketed products. In each of these collaborations, the deuterium-modified compound was independently discovered at Concert. Our collaborators are responsible for any future clinical development activities and disclosures associated with these following programs.

- AVP-786 is a combination of deudextromethorphan and an ultra-low dose of quinidine being investigated for the treatment of neurologic and psychiatric disorders that is being developed under a collaboration with Avanir. In November 2015, Avanir announced the initiation of the Phase 3 clinical program to evaluate the safety and efficacy of AVP-786 for the treatment of agitation associated with Alzheimer’s disease. It expects to enroll approximately 850 patients in two U.S. Phase 3 trials. The U.S. Phase 3 trials are expected to be completed in 2019 and are expected to be part of the submission package. Additionally, in October 2017, Avanir initiated a Phase 3 trial which is expected to enroll approximately 400 patients to evaluate the safety and efficacy of AVP-786 for the treatment of agitation associated with Alzheimer's disease in territories outside the United States.
- CTP-730 is a deuterated analog of apremilast that is being developed under a collaboration with Celgene. Apremilast is a selective phosphodiesterase 4 (PDE4) inhibitor approved in various countries for the treatment of plaque psoriasis and psoriatic arthritis. We have completed the Phase 1 clinical evaluation of CTP-730. Once daily dosing of 50 mg of CTP-730 administered for seven days in the Phase 1 clinical trial demonstrated similar steady state exposure to historical data for 30 mg of apremilast twice daily. Treatment with CTP-730 was generally well-tolerated and no

serious adverse events were observed. Celgene is responsible for any development of CTP-730 beyond the completed Phase 1 clinical trials. Celgene is assessing the path forward for CTP-730. However, CTP-730 has not advanced into new trials at this time.

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

ASSET PURCHASE AGREEMENT WITH VERTEX PHARMACEUTICALS FOR CTP-656

In July of 2017, we completed a previously announced Asset Purchase Agreement under which Vertex acquired worldwide development and commercialization rights to CTP-656 and other assets related to the treatment of cystic fibrosis (CF). CTP-656, now known as VX-561, is an investigational cystic fibrosis transmembrane conductance regulator (CFTR) potentiator that has the potential to be used as part of future once-daily combination regimens of CFTR modulators that treat the underlying cause of cystic fibrosis. We received $160 million in cash upon closing, and we are eligible to receive up to $90 million in additional milestones based on regulatory approval in the U.S. and agreement for reimbursement in the first of the U.K., Germany or France.

FINANCIAL OPERATIONS OVERVIEW

Since our inception in 2006, we have devoted substantially all of our resources to our research and development efforts, including activities to develop our deuterated chemical entity platform, or DCE Platform®, and our core capabilities in deuterium chemistry, to identify potential product candidates, undertake nonclinical studies and clinical trials, manufacture clinical trial material in compliance with current good manufacturing practices, provide general and administrative support for these operations and establish our intellectual property. We have generated an accumulated deficit of $78.3 million since inception through June 30, 2018 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, funding from collaborations and patent assignments, an asset sale, and other arrangements.

Our operating results may fluctuate significantly from year to year, depending on the timing and magnitude of cash payments received pursuant to collaboration and licensing arrangements and other agreements and the timing and magnitude of clinical trial and other development activities under our current development programs. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations.

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

We do not expect to generate revenue from product sales unless and until we, or our collaborators, obtain marketing approval for one or more of our product candidates, which we expect will take a number of years and is subject to significant uncertainty. If we obtain, or believe that we are likely to obtain, marketing approval for any product candidates for which we retain commercialization rights and intend to commercialize a product, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. In addition to using the proceeds from the sale of assets to Vertex, we expect to seek to fund our operations through a combination of equity offerings, debt financings and additional collaborations and licensing arrangements, and other arrangements for at least the next several years. In the future, 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.

Revenue

We have not generated any revenue from the sales of approved 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, a patent assignment agreement, and an asset sale. On January 1, 2018, we adopted ASC 606 using the modified retrospective approach. For detailed information regarding ASC 606 and the actual impact on our

condensed consolidated financial statements, see Note 2 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

The terms of these agreements may include one or more of the following types of payments: non-refundable license fees, payments for research and development activities, payments based upon the achievement of specified milestones, payment of license exercise or option fees relating to product candidates and royalties on any net product sales. To date, we have received non-refundable upfront payments, several milestone payments, payments for research and development services provided to our collaborators, a change in control payment pursuant to a patent assignment agreement, and a payment for the sale of an asset. 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, milestone payments or royalties on product sales in connection with our current collaborations with Avanir, Celgene, and Jazz Pharmaceuticals, our asset sale with Vertex, our license to Processa, 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, and stock-based compensation expense;
- expenses incurred under agreements with contract research organizations and investigative sites that conduct our clinical trials;
- the cost of acquiring, developing and manufacturing clinical trial materials;
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance and other supplies;
- platform-related lab expenses, which includes costs related to synthesis, analysis and in vitro and in vivo characterization of deuterated compounds and in some cases their non-deuterated analogs to support the selection and progression of potential product candidates;
- expenses related to consultants and advisors; and
- costs associated with nonclinical activities and regulatory operations.

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

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

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

- the scope and rate of progress of our ongoing as well as any additional clinical trials and other research and development activities;
- conduct of and results from ongoing as well as any additional clinical trials and research and development activities;
- significant and changing government and regulatory body regulation;
- the terms and timing and receipt of any regulatory approvals;
- the performance of our collaborators;
- our ability to manufacture any of our product candidates that we are developing or may develop in the future; and

- the expense and success of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights, including potential claims that we infringe other parties' intellectual property.

A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. For example, if the FDA or another regulatory authority were to require us to conduct clinical trials or other research and development activities beyond those that we currently anticipate will be required for the completion of clinical development of a product candidate, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development. Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, due to the increased size and duration of later-stage clinical trials and the manufacturing that is typically required for those later-stage clinical trials. We expect research and development costs to increase significantly for the foreseeable future as our product candidate development programs progress but we do not believe that it is possible at this time to accurately project total program-specific expenses through commercialization. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

General and administrative expenses

General and administrative expenses consist primarily of salaries and related costs for personnel, including stock-based compensation 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. In 2017, we also incurred expenses responding to the Federal Trade Commission's requests for information and documentation in connection with their review of the Vertex Asset Purchase Agreement.

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.

Unrealized Gains (Losses) on Marketable Equity Securities

As discussed in Note 2, effective January 1, 2018 we prospectively adopted ASU 2016-01, resulting in the recognition of the effects of changes in fair value of equity securities within net income. Unrealized gains (losses) on marketable equity securities consists of changes in the fair value of common shares of Processa held by us, discussed further in Note 7 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

Investment income

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

Income Taxes

We record a provision or benefit for income taxes on pre-tax income or loss based on our estimated effective tax rate for the year. As of June 30, 2018, we forecast an ordinary pre-tax loss for the year ended December 31, 2018 and, since we maintain a full valuation allowance on our deferred tax assets, we did not record an income tax benefit for the three and six months ended June 30, 2018.

We recorded a provision for income taxes of $0.3 million during the six months ended June 30, 2018 for interest owed to Federal and State tax authorities. The $16 million held in escrow from the Asset Purchase Agreement with Vertex is recognized under the installment sale method and therefore deferred for income tax purposes until the cash is received. Under the provisions of Section 453A of the Internal Revenue Code, we are required to recognize interest on the portion of the installment sale outstanding as of the close of each taxable year that exceeds $5 million. Refer to Note 7 in the accompanying condensed

consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q for additional details related to our Asset Purchase Agreement with Vertex.

To the extent new information becomes available, we may revise our forecast of ordinary pre-tax income or loss, and therefore the estimated effective tax rate, in future periods. The potential effect of a non-recognized subsequent event is considered in our estimated effective tax rate in the period in which the event occurs.

In accordance with SAB 118, our preliminary estimate of the effects TCJA, including the remeasurement of deferred tax assets and liabilities and the recognition of an income tax benefit related to AMT tax credit carryforwards, is subject to the finalization of management's analysis related to certain matters, such as developing interpretations of the provisions of the TCJA and the filing of our tax returns. U.S. Treasury regulations, administrative interpretations or court decisions interpreting the TCJA may require further adjustments and changes in our estimates. The final determination of the effects of the TCJA will be completed as additional information becomes available, but no later than one year from the enactment of the TCJA. In all cases, we will continue to make and refine our calculations as additional analysis is completed. In addition, our estimates may also be affected as we gain a more thorough understanding of the tax law.

Critical Accounting Policies and Significant Judgments and Estimates

Our critical accounting policies are those policies which require the most significant judgments and estimates in the preparation of our condensed consolidated financial statements.

We adopted ASC 606 effective January 1, 2018, which is a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The new revenue standard is based on the principle that an entity should recognize revenue to depict the transfer of 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. The new revenue standard also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, and costs to obtain or fulfill contracts. We applied ASC 606 on January 1, 2018 to all contracts using the modified retrospective approach. For additional details regarding our adoption of ASC 606, refer to Note 2 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

With the exception of the adoption of ASC 606, there were no material changes to our critical accounting policies as detailed in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017, which was filed with the Securities and Exchange Commission on March 1, 2018.

Pending and Recently Adopted Accounting Pronouncements

For detailed information regarding recently issued accounting pronouncements and the actual and expected impact on our condensed consolidated financial statements, see Note 2 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

RESULTS OF OPERATIONS

Comparison of the three months ended June 30, 2018 and 2017

The following table summarizes our results of operations for the three months ended June 30, 2018 and 2017, together with the changes in those items in dollars.

	Three months ended June 30,		
(in thousands)	2018	2017	Change
Revenue:			
License and research and development revenue	$2	$15	$(13)
Total revenue	2	15	(13)
Operating expenses:			
Research and development	8,862	7,285	1,577
General and administrative	5,514	5,707	(193)
Total operating expenses	14,376	12,992	1,384
Loss from operations	(14,374)	(12,977)	(1,397)
Investment income	660	155	505
Interest and other expense	—	(205)	205
Unrealized gain on equity securities	669	—	669
Loss before tax provision	(13,045)	(13,027)	(18)
Provision for income taxes	280	—	280
Net Loss	$(13,325)	$(13,027)	$(298)

License and Research and Development Revenue

Total revenue was $2 thousand for the three months ended June 30, 2018 as compared to $15 thousand for the prior year period, a decrease of $13 thousand. The decrease in revenue in the 2018 period was attributable to a decrease in our activities related to development support services performed under our collaboration with Jazz Pharmaceuticals. Effective January 1, 2018, we adopted ASC 606 using the modified retrospective approach. As a result of the adoption, the cumulative impact to retained earnings at January 1, 2018 was $15.8 million. Of the $15.8 million, $16.0 million was attributable to the recognition of a contract asset related to the escrow payment that will come due under our Vertex Asset Purchase Agreement, subject to any indemnification claims that Vertex might make. Because the amount was recognized in the ASC 606 transition adjustment, the escrow payment will not result in additional revenue when the cash is received. For additional details related to our adoption of ASC 606, see Notes 2 and 7 in the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q. Subsequent to our adoption of ASC 606, we had deferred revenue as of June 30, 2018 consisting of:

- $7.8 million related to our collaboration with Celgene, $1.4 million of which is attributable to the CTP-730 program and is currently expected to be recognized as revenue in the next twelve months as we satisfy our remaining research and development activities pursuant to mutually agreed upon development plans, and $6.4 million of which is attributable to two additional license programs that we will not recognize as revenue until Celgene exercises its rights with respect to those programs, or at such time that Celgene's rights lapse, as detailed in Note 7 in the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q; and
- $2.8 million related to a payment received from GlaxoSmithKline, or GSK, that we will not recognize as revenue until all repayment obligations lapse.

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Research and development expenses

The following table summarizes our external research and development expenses, by program, for the three months ended June 30, 2018 and 2017, 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 investments in the program during these periods.

	Three Months Ended June 30,	
(in thousands)	2018	2017
CTP-543 external costs	$2,133	$929
CTP-692 external costs	764	—
CTP-656 external costs	—	1,308
External costs for other programs	515	300
Employee and contractor-related expenses	4,133	3,842
Facility and other expenses	1,317	906
Total research and development expenses	$8,862	$7,285

Research and development expenses were $8.9 million for the three months ended June 30, 2018, compared to $7.3 million for the prior year period, an increase of $1.6 million. The increase of $1.2 million in CTP-543 expenses was attributable to the ongoing Phase 2 clinical study. The increase of $0.8 million in CTP-692 expenses was attributable to preclinical studies and the manufacture of clinical drug product to support the advancement of the program into Phase 1 clinical trials. The increase of $0.2 million in external cost for other programs was attributable to increased activity assessing additional pipeline candidates. Employee and contractor-related expenses increased approximately $0.3 million due to an increase in non-cash stock based compensation expense, which was due to RSUs granted in the third quarter of 2017. Facility and other expenses increased $0.4 million due to the recognition of rental expense for the new office and laboratory facility lease entered into December 2017, discussed further in Note 11 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q. These increases were offset by a decrease in CTP-656 expenses that was attributable to the completion of the asset sale to Vertex in 2017.

General and administrative expenses

General and administrative expenses were $5.5 million for the three months ended June 30, 2018, compared to $5.7 million for the prior year period. The decrease of $0.2 million was primarily attributable to a $1.0 million decrease in professional and legal expenses, offset by a $0.8 million increase in compensation expenses, primarily driven by non-cash stock-based compensation expense due to RSUs granted in the third quarter of 2017. The decrease in professional and legal expenses in the 2018 period was primarily due to costs incurred in the 2017 period for the asset sale with Vertex and the defense of our CTP-543 patent.

Investment income

Investment income was $0.7 million and $0.2 million for the three months ended June 30, 2018 and 2017, respectively. The increase in investment income was attributable to an increase in investments held during the 2018 period.

Unrealized gain on equity securities

During the three months ended June 30, 2018, we granted Processa an exclusive, worldwide, royalty-bearing license to develop, manufacture and commercialize CTP-499 in exchange for upfront consideration of 2,090,301 shares of common stock of Processa, discussed further in Note 7 of the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q. We recognized an unrealized gain of $0.7 million for the three

months ended June 30, 2018 due to the change in fair value of the underlying equity securities.

Provision for Income Taxes

Income tax expense was $0.3 million for the three months ended June 30, 2018, compared to no expense for the prior year period. We recorded a provision for income taxes of $0.3 million in the current period for interest owed to Federal and State tax authorities due to the deferral of $16 million in income from Vertex for cash currently held in escrow, as discussed further in Note 6 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

Comparison of the six months ended June 30, 2018 and 2017

The following table summarizes our results of operations for the six months ended June 30, 2018 and 2017, together with the changes in those items in dollars.

	Six months ended June 30,		
(in thousands)	2018	2017	Change
Revenue:			
License and research and development revenue	$10,481	$35	$10,446
Total revenue	10,481	35	10,446
Operating expenses:			
Research and development	17,518	15,522	1,996
General and administrative	11,144	10,960	184
Total operating expenses	28,662	26,482	2,180
Loss from operations	(18,181)	(26,447)	8,266
Investment income	1,300	292	1,008
Interest and other expense	—	(205)	205
Unrealized loss on equity securities	(627)	—	(627)
Loss before tax provision	(17,508)	(26,360)	8,852
Provision for income taxes	280	—	280
Net Loss	$(17,788)	$(26,360)	$8,572

License and Research and Development Revenue

Total revenue was $10.5 million for the six months ended June 30, 2018 as compared to $35 thousand for the prior year period, an increase of approximately $10.5 million. The increase in revenue in the 2018 period was attributable to the closing of the transaction contemplated by the Amendment with Processa, discussed in Note 7 in the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

Research and development expenses

The following table summarizes our external research and development expenses, by program, for the six months ended June 30, 2018 and 2017, 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 investments in the program during these periods.

	Six Months Ended June 30,	
(in thousands)	2018	2017
CTP-543 external costs	$4,187	$2,452
CTP-692 external costs	950	—
CTP-656 external costs	—	2,681
External costs for other programs	1,149	550
Employee and contractor-related expenses	8,645	8,015
Facility and other expenses	2,587	1,824
Total research and development expenses	$17,518	$15,522

Research and development expenses were $17.5 million for the six months ended June 30, 2018, compared to $15.5 million for the prior year period, an increase of $2.0 million. The increase of $1.7 million in CTP-543 expenses was attributable to the ongoing Phase 2 clinical study. The increase of $1.0 million in CTP-692 expenses was attributable to preclinical studies and the manufacture of clinical drug product to support the advancement of the program into Phase 1 clinical trials. The increase of $0.6 million in external cost for other programs was attributable to increased activity assessing additional pipeline candidates. Employee and contractor-related expenses increased approximately $0.6 million due to an increase in non-cash stock based compensation expense, which was due to RSUs granted in the

third quarter of 2017. Facility and other expenses increased $0.8

million due to the recognition of rental expense for the new office and laboratory facility lease entered into December 2017, discussed further in Note 11 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q. These increases were offset by a decrease in CTP-656 expenses, attributable to the completion of the asset sale to Vertex in 2017.

General and administrative expenses

General and administrative expenses were $11.1 million for the six months ended June 30, 2018, compared to $11.0 million for the prior year period. The increase of $0.1 million was primarily attributable to a $1.9 million increase in compensation expenses, primarily driven by non-cash stock-based compensation expense due to RSUs granted in the third quarter of 2017, and a $0.5 million increase in rental expense for the new office and laboratory facility lease, partially offset by a $2.2 million decrease in professional and legal expenses. The decrease in professional and legal expenses in the 2018 period was primarily due to costs incurred in the 2017 period for the asset sale with Vertex and the defense of our CTP-543 patent.

Investment income

Investment income was $1.3 million and $0.3 million for the six months ended June 30, 2018 and 2017, respectively. The increase in investment income was attributable to an increase in investments held during the 2018 period.

Unrealized loss on equity securities

During the six months ended June 30, 2018, we granted Processa an exclusive, worldwide, royalty-bearing license to develop, manufacture and commercialize CTP-499 in exchange for upfront consideration of 2,090,301 shares of common stock of Processa, discussed further in Note 7 of the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q. We have recognized an unrealized loss of $0.6 million during the six months ended June 30, 2018 due to the change in fair value of the underlying equity securities as of June 30, 2018.

Provision for Income Taxes

Income tax expense was $0.3 million for the six months ended June 30, 2018, compared to no expense for the prior year period. We recorded a provision for income taxes of $0.3 million in the current period for interest owed to Federal and State tax authorities due to the deferral of $16 million in income from Vertex for cash currently held in escrow, as discussed further in Note 6 in the accompanying condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

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.

LIQUIDITY AND CAPITAL RESOURCES

We have incurred cumulative losses and negative cash flows from operations since our inception in April 2006, and as of June 30, 2018, we had an accumulated deficit of $78.3 million. We generated net income for fiscal year 2015 due to a payment from Auspex and again in 2017 from the closing of our sale of CTP-656 to Vertex, but we anticipate that we will continue to incur losses for at least the next several years. We expect that our research and development and general and administrative expenses will continue to increase and, as a result, we will need additional capital to fund our operations, which we may raise through a combination of equity offerings, debt financings, additional collaborations and licensing arrangements, and other sources.

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

In June 2015, we received proceeds of $50.2 million in connection with the change in control payment from Auspex, relating to Teva Pharmaceutical Industries Ltd.’s acquisition of Auspex.

On July 25, 2017, the Vertex Asset Purchase Agreement was completed and Vertex paid us $160 million in cash consideration, with $16 million of such consideration to initially be held in escrow.

As of June 30, 2018, we had cash and cash equivalents and investments of $180.3 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:

	Six months ended June 30,	
(in thousands)	2018	2017
Net cash provided by (used in):		
Operating activities	$(21,205)	$(23,535)
Investing activities	52,194	(20,565)
Financing activities	(295)	31,136
Net increase (decrease) in cash and cash equivalents and restricted cash	$30,694	$(12,964)

Operating activities. The cash used for operating activities generally approximates our net loss adjusted for non-cash items and changes in operating assets and liabilities. Non-cash items adjusted during the six months ended June 30, 2018 include stock-based compensation, the non-cash revenue recognized from the receipt of equity securities from Processa, as well as the unrealized loss recorded on those securities during the period. Additional details related to the transaction with Processa are discussed further in Note 10 of the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

During the six months ended June 30, 2018, our operating activities used cash of $21.2 million as compared to cash used by operating activities of $23.5 million during the prior year period. Cash used in operating activities during 2018 was primarily driven by our development activities associated with CTP-692 and CTP-543, our wholly owned development programs. Cash used in operating activities during 2017 was primarily driven by our development activities associated with CTP-543, our wholly owned development program, as well as CTP-656, which was wholly owned at that time and subsequently sold to Vertex in July 2017.

Investing activities. Net cash provided by or 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 six months ended June 30, 2018 and 2017 was $9.4 million and $64.9 million, respectively. Net cash provided by maturities of investments for the six months ended June 30, 2018 and 2017 was $63.1 million and $44.6 million, respectively. Purchases of fixed assets for

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the six months ended June 30, 2018 and 2017 was $1.5 million and $0.2 million, respectively. The increase in the purchases of fixed assets during the 2018 period is primarily due to new office and laboratory equipment purchased to support the new office and laboratory space at 65 Hayden, Lexington, Massachusetts, discussed further in Note 11 of the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

Financing activities. During the six months ended June 30, 2018 and 2017, our financing activities used cash of $0.3 million and provided cash of $31.1 million, respectively. The cash used in financing activities during the six months ended June 30, 2018 was attributable to withholding taxes paid in lieu of shares surrendered upon the vesting of restricted stock. The cash provided by financing activities during the six months ended June 30, 2017 was attributable to net proceeds of $29.7 million under our Loan Agreement with Hercules as well as $1.5 million attributable to proceeds from the exercise of stock options.

Operating capital requirements

We do not anticipate commercializing any of our product candidates for several years. Although we generated net income in 2017 and 2015 due to payments from Vertex and Auspex, respectively, we anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our product candidates, and begin to commercialize any approved products for which we retain commercialization rights. We are subject to all of the risks incident in the development of new drug products, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business, as well as additional risks stemming from the unproven nature of deuterated drugs.

Based on our current expectations, including with respect to our development plans, we believe our existing cash and cash equivalents and investments as of June 30, 2018 will enable us to fund our operating expenses and capital expenditure requirements into 2021. However, we will require additional capital for the further development of our existing product candidates and may also need to raise additional funds sooner to pursue other development activities related to additional product candidates.

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

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

conduct our business.

Our expectation with respect to the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors, including those discussed in the “Risk Factors” section of this Quarterly Report on Form 10-Q. 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

As of June 30, 2018, the Company's contractual obligations remain consistent with those disclosed in the Annual Report on Form 10-K for the year ended December 31, 2017.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

We are exposed to market risk related to changes in interest rates. Our current investment policy is to maintain a diversified investment portfolio in U.S. government-backed securities and money market mutual funds consisting of U.S. government-backed securities. Our cash is deposited in and invested through highly rated financial institutions in North America. As of June 30, 2018 and December 31, 2017, we had $180.3 million and $203.2 million of cash, cash equivalents and investments, respectively. The fair value of cash equivalents and short-term investments is subject to change as a result of potential changes in market interest rates. Due to the short-term maturities of our cash equivalents and the low risk profile of these investments, an immediate 100 basis point change in interest rates at levels as of June 30, 2018 would not have a material effect on the fair market value of our cash equivalents and short term investments.

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

Inflation generally affects us by increasing our cost of labor and clinical trial costs. We do not believe that inflation had a material effect on our business, financial condition or results of operations during the three and six months ended June 30, 2018.

Item 4. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, refers to controls and procedures that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives. Our management, with the participation of our Chief Executive Officer and Principal Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of June 30, 2018, the end of the period covered by this Quarterly Report on Form 10-Q. Based upon such evaluation, our Chief Executive Officer and Principal Financial Officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of such date.

Changes in Internal Control over Financial Reporting

During the six months ended June 30, 2018, we implemented certain internal controls in connection with our adoption of ASC 606. There were no other changes in our internal control over financial reporting that occurred during the period covered by this Quarterly Report on Form 10-Q that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

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 Quarterly Report on Form 10-Q 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.

As of June 30, 2018, we had an accumulated deficit of $78.3 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, a patent assignment agreement, and an asset sale. We have not completed development of any product candidate and have devoted substantially all of our financial resources and efforts to research and development, including nonclinical studies and our clinical development programs. We expect to continue to incur significant expenses and increasing operating losses for at least the next several years. Our net losses may fluctuate significantly from quarter to quarter and year to year. Net losses and negative cash flows have had, and will continue to have, an adverse effect on our stockholders' equity and working capital.

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

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

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

or part of their investments in us.

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

We began operations in April 2006. Our operations to date have been limited to financing and staffing our Company, developing our technology and product candidates and establishing collaborations. We have not yet demonstrated an ability to

successfully conduct an international multi-center clinical trial, conduct a large-scale pivotal clinical trial, obtain marketing approvals, manufacture product on a commercial scale or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing pharmaceutical products.

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

Developing pharmaceutical products, including conducting nonclinical studies and clinical trials, is a very time-consuming, expensive and uncertain process that takes years to complete. We expect our expenses to increase in connection with our ongoing activities, particularly as we initiate new clinical trials of, initiate new research and nonclinical development efforts for and seek marketing approval for, our product candidates, or if we in-license or acquire product candidates. In addition, if we obtain marketing approval for any of our product candidates, we may incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution to the extent that such sales, marketing and distribution are not the responsibility of one of our collaborators. In particular, the costs that we may be required to incur for the manufacture of any product candidate that receives marketing approval may be substantial. Manufacturing a deuterated drug at commercial scale may require specialized facilities, processes and materials. Furthermore, we will continue to incur costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we may be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

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

We believe our existing cash and cash equivalents and investments as of June 30, 2018 will enable us to fund our operating expenses and capital expenditure requirements into 2021. Our estimate as to how long we expect our cash and cash equivalents and investments to be able to continue to fund our operations is based on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Changing circumstances could cause us to consume capital significantly faster than we currently anticipate, and we may need to spend more money than currently expected because of circumstances beyond our control. Our future funding requirements, both short-term and long-term, will depend on many factors, including:

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

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

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of public or private equity offerings, debt financings, additional collaborations and licensing

arrangements, and other sources. We do not have any committed external source of funds, other than cash held in escrow pursuant to the Vertex Asset Purchase Agreement and potential milestone payments under the Asset Purchase Agreement with Vertex, as well as potential milestone payments and royalties under our agreements with Avanir, Celgene, Jazz Pharmaceuticals, and Processa, each of which is subject to the achievement of development, regulatory and/or sales-based milestones with respect to our product candidates. To the extent that we raise additional capital through the sale of common stock, convertible securities or

other equity securities, the ownership interests of our stockholders may be materially diluted, and the terms of these securities could include liquidation or other preferences and anti-dilution protections that could adversely affect the rights of our stockholders. In addition, debt financing, if available, would result in increased fixed payment obligations and may involve agreements that include restrictive covenants that limit our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends, that could adversely impact our ability to conduct our business.

If we raise additional funds through collaborations or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams or product candidates, or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

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

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

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

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

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

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

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

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

drug candidates that progressed into advanced clinical development. Particularly in these situations, existing information regarding the corresponding non-deuterated compound may not be sufficient to mitigate drug development risks.

In addition to the risk of failure inherent in drug development, certain of the deuterated compounds that we, and our collaborators, are developing and may develop in the future may be particularly susceptible to failure to the extent they are based on compounds that others have previously studied or tested, but did not progress in development due to safety,

tolerability or efficacy concerns or otherwise. Deuteration of these compounds may not be sufficient to overcome the problems experienced with the corresponding non-deuterated compound.

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

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

- in the case of CTP-543, our ability to safely and effectively treat moderate-to-severe alopecia areata;
- successful completion of clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- the performance of our future collaborators, if any, for our programs;
- the extent of any required post-marketing approval commitments to applicable regulatory authorities;
- establishment of supply arrangements with third party raw materials suppliers and manufacturers;
- our ability to manufacture or arrange for the manufacture of our active pharmaceutical ingredients and drug products with sufficient quality, quantity, and reproducibility to support clinical trials and potential future commercialization;
- establishment of arrangements with third party manufacturers to obtain finished drug products that are appropriately packaged for sale;
- obtaining and maintaining patent, trade secret protection, regulatory exclusivity, and freedom to operate, both in the United States and internationally;
- amount of commercial sales, if and when approved;
- a continued acceptable safety profile of our programs following any marketing approval; and
- agreement by third party payors to reimburse patients for the costs of treatment with our products, and the terms of such reimbursement.

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

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

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

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

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

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

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

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

- toxicity or serious adverse effects may be observed in our nonclinical studies causing us to delay or abandon clinical trials;
- clinical trials of our product candidates may produce unfavorable or inconclusive results;
- we, or our collaborators, may decide, or regulators may require us or them, to conduct additional clinical trials and or develop and or validate new clinical endpoints for our clinical trials, or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we, or our collaborators, anticipate, patient enrollment in these clinical trials may be slower than we, or our collaborators, anticipate or participants may drop out of these clinical trials at a higher rate than we, or our collaborators, anticipate;
- our third party contractors or those of our collaborators, including those manufacturing our product candidates or components or ingredients thereof or conducting clinical trials on our behalf or on behalf of our collaborators, may fail to comply with regulatory requirements or meet their contractual obligations to us or our collaborators in a timely manner or at all;
- regulators or institutional review boards may not authorize us, our collaborators or our or their investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we, or our collaborators, may have delays in reaching or fail to reach agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- patients that enroll in a clinical trial may misrepresent their eligibility to do so or may otherwise not comply with the clinical trial protocol, resulting in the need to drop the patients or the sites from the clinical trial, increase the needed enrollment size for the clinical trial, extend the clinical trial's duration or cause spurious results;
- investigators may provide inaccurate or false data, resulting in spurious clinical results, an inadequate data set or regulators' unwillingness to approve a product;
- regulators, institutional review boards or data monitoring committees may require that we, or our collaborators, or our or their investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or their standards of conduct, a finding that the participants are being exposed to unacceptable health risks, undesirable side effects or other unexpected characteristics of the product candidate or findings of undesirable effects caused by a chemically or mechanistically similar drug or drug candidate;
- the FDA or comparable foreign regulatory authorities may disagree with our or our collaborators' clinical trial design or our or their interpretation of data from nonclinical studies and clinical trials;
- the FDA or comparable foreign regulatory authorities may change their requirements for approvability for a given product or for an indication after we have initiated work based on their previous guidance;
- the supply or quality of raw materials or manufactured product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient, inadequate or not available at an acceptable cost, or we may experience interruptions in supply;
- we, or our manufacturing vendors, may not produce, or may not consistently produce material that meets necessary specifications for commercialization;
- the FDA or comparable foreign regulatory authorities may determine that our, or our manufacturing vendors, manufacturing or quality control processes fail to meet their specifications or guidelines; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient to obtain marketing approval.

Product development costs for us, or our collaborators, will increase if we, or they, experience delays in testing or pursuing marketing approvals and we, or they, may be required to obtain additional funds to complete clinical trials

and prepare for possible commercialization of our product candidates. We, and our collaborators, do not know whether any nonclinical tests or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant nonclinical or clinical trial delays also could shorten any periods during which we, or our collaborators, may have the exclusive right to commercialize our product candidates or allow our competitors, or the competitors of our collaborators, to bring products to market before we, or our collaborators, do and impair our ability, or the ability of our collaborators, to successfully commercialize our product candidates and may harm our business and results of operations. In addition, many of the factors

that cause, or lead to, clinical trial delays may ultimately lead to the denial of marketing approval of any of our product candidates.

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

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

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

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

Fast Track designation by the FDA may not lead to a faster development, regulatory review or approval.

Although CTP-543 has been granted Fast Track designation by FDA for the treatment of alopecia areata, Fast Track designation does not necessarily lead to a faster development pathway or regulatory review process, and does not increase the likelihood of regulatory approval. The FDA may later withdraw the designation if they believe the designation is no longer supported by the data from our clinical development program.

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

The deuterated compounds that we produce and seek to develop can have similar pharmacological properties as their corresponding non-deuterated compounds. Therefore, we believe that we, or our collaborators, may, in some instances, be able to obtain clearance from the FDA or comparable foreign regulatory authorities to follow expedited development programs for some deuterated compounds that reference and rely on findings previously obtained from prior nonclinical studies or clinical trials of the corresponding non-deuterated compounds.

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

compounds.

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

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

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

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

The increasing use of social media platforms presents risks and challenges.

The increasing use of social media platforms presents risks and challenges. Social media increasingly is being used by third parties to communicate about our drug candidates and the diseases they are designed to treat. We believe that members of the Alopecia Areata community may be more active on social media as compared to other patient populations due to the demographics of this patient population. Social media practices in the pharmaceutical and biotechnology industries are evolving, which creates uncertainty and risk of noncompliance with regulations applicable to our business. For example, patients in clinical trials may use social media platforms to comment on the effectiveness of, or adverse experiences with, a drug candidate which could result in reporting obligations. In addition, there is a risk of inappropriate disclosure of sensitive information or negative or inaccurate posts or comments about us on any social networking website. If any of these events were to occur or we otherwise fail to comply with applicable regulations, we could incur liability, face restrictive regulatory actions or incur other harm to our business.

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 formulary decision-makers, and others in the medical or patient communities. For example, physicians are often reluctant to switch their patients from existing therapies even when new and potentially more effective or convenient treatments enter the market. Further, patients often acclimate to the

therapy that they are currently taking and do not want to switch unless their physicians recommend switching products or they are required to switch therapies due to lack of reimbursement for existing therapies. If any of our product candidates receive negative publicity, patients may choose not to request them even if approved, or may not comply with taking them as prescribed.

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

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

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

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

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

- regulatory authorities may withdraw their approval of the drug and/or seize the drug;
- we, or our collaborators, may be required to recall the drug or change the way the drug is administered;
- additional restrictions may be imposed on the marketing of, or the manufacturing processes for, the particular drug, including the addition of labeling statements, such as a "black box" warning or a contraindication;
- we may be subject to fines, injunctions or the imposition of civil or criminal penalties;
- we, or our collaborators, may be required to create a Medication Guide outlining the risks of the previously unidentified side effects for distribution to patients;
- we, or our collaborators, could be sued and held liable for harm caused to patients; and
- the drug may become less competitive.

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

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

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

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

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

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

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

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

Avanir is developing AVP-786 for the treatment of agitation associated with Alzheimer's disease and other neurologic or psychological disorders. There are competing marketed drugs and product candidates in clinical development for each indication. Intra-Cellular Therapies, Axsome Therapeutics, and Otsuka Pharmaceuticals and their partner Lundbeck, are developing treatments for agitation in patients with Alzheimer's disease.

We are developing CTP-543 as an oral agent for the treatment of moderate-to-severe alopecia areata. If CTP-543 receives marketing approval for this indication, it may face competition from a number of other product candidates

that are being studied for alopecia areata. Ruxolitinib is a Janus kinase, or JAK, inhibitor. A number of companies are pursuing development of oral JAK inhibitors with a range of subtype selectivities for the treatment of alopecia areata, including Aclaris Therapeutics, Eli Lilly and Pfizer.

We are developing CTP-692 as an adjunctive treatment of schizophrenia. There are a number of candidates in clinical development for adjunctive treatment of schizophrenia, exploring cognitive or negative symptoms of the disease, including Acadia Pharmaceuticals and SyneuRx International [Taiwan] Corp.

JZP-386 is being developed for the treatment of excessive daytime sleepiness and cataplexy in patients with narcolepsy. The current standard of care is sodium oxybate. Avadel Pharmaceuticals is developing an extended release formulation of sodium oxybate for the treatment of narcolepsy. Hikma Pharmaceuticals PLC developed a generic version of Xyrem® for the treatment of narcolepsy, which was approved by the FDA in January 2017 but will not be marketed until 2023, or earlier under certain circumstances.

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

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

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

We also face competition in the development of deuterated compounds.

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

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

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

Once an NDA is approved, the product covered thereby becomes a “reference listed drug” in the FDA’s publication, “Approved Drug Products with Therapeutic Equivalence Evaluations.” Manufacturers may seek approval of generic versions of reference listed drugs through submission of abbreviated new drug applications, or ANDAs, in the United States. In support of an ANDA, a generic manufacturer need not conduct clinical studies. Rather, the applicant

generally must show that its product has the same active ingredient(s), dosage form, strength, route of administration and conditions of use or labeling as the reference listed

drug and that the generic version is bioequivalent to the reference listed drug, meaning it is absorbed in the body at the same rate and to the same extent. Generic products may be significantly less costly to bring to market than the reference listed drug and companies that produce generic products are generally able to offer them at lower prices. Thus, following the introduction of a generic drug, a significant percentage of the sales of any branded product or reference listed drug is typically lost to the generic product.

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

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

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

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

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

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

The commercial success of our product candidates will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy

benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third party payors. Government authorities and third party payors, such as private health insurers and health maintenance organizations, decide which medications they will cover and establish reimbursement levels. The healthcare

industry is acutely focused on cost containment, both in the United States and elsewhere. Government authorities and third party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications, which could affect our ability or that of our collaborators to sell our product candidates profitably. These payors may not view our products, if any, as cost-effective, and coverage and reimbursement may not be available to our customers, or those of our collaborators, or may not be sufficient to allow our products, if any, to be marketed on a competitive basis. Cost-control initiatives could cause us, or our collaborators, to decrease the price we, or they, might establish for products, which could result in lower than anticipated product revenues. If reimbursement is not available, or is available only to limited levels, we, or our collaborators, may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us, or our collaborators, to establish or maintain pricing sufficient to realize a sufficient return on our or their investments.

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

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

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

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

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

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

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

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

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

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

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

RISKS RELATED TO OUR DEPENDENCE ON THIRD PARTIES

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

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

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs, based on clinical trial results, changes in the collaborators' strategic focus or available funding or external factors, such as an acquisition, that divert resources or create competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
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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 may seek one or more collaborators for the development and commercialization of one or more of our product candidates.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the potential differentiation of our product candidate from its corresponding non-deuterated analog, design or results of clinical trials, the likelihood of approval by the FDA or comparable foreign regulatory authorities and the regulatory pathway for any such approval, the potential market for the product candidate, the proposed collaborator's perception of our freedom to operate in a particular market or markets without challenge, the costs and complexities of manufacturing and delivering the product to patients and the potential of competing products. The collaborator may also consider alternative product candidates or technologies that may be available for collaboration and whether such collaboration could be more attractive than the one with us for our product candidate. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators. We are also restricted under the terms of certain of our existing collaboration agreements from entering into collaborations regarding or otherwise developing specified compounds that are similar to the compounds that are subject to those agreements and collaboration agreements that we enter into in the future may contain further restrictions on our ability to enter into potential collaborations or to otherwise develop specified compounds.

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

non-deuterated compound.

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

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

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

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

We also rely on other third parties to store, label and distribute drug supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of any resulting products, producing additional losses and depriving us of potential product revenue.

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

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

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

United States.

In order to internationally transport any deuterium oxide that we purchase from our current or potential future foreign suppliers, we, or our suppliers, may be required to obtain an export license from the country of origin and we may be required to obtain an International Import Certificate or other governmental approvals or assurances from the country of destination. We are also required to obtain an export license from the Nuclear Regulatory Commission before shipping deuterium oxide from the United States to any contract manufacturer in another country. Export licenses and certain other required documents may specify the

maximum amount of deuterium oxide that we, or our suppliers, are permitted to either import or export. In order for us to obtain supplies of deuterium oxide from foreign suppliers, they may be required to obtain an export license from the country of origin and we may be required to obtain domestic governmental approvals or assurances. In addition, our current U.S. export licenses may be insufficient to meet our future requirements. We, or our suppliers, may not be able to obtain such licenses, approvals or assurances in a timely manner or at all.

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

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

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

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

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

We currently rely, and expect to continue to rely, on third party contractors to manufacture nonclinical and clinical supplies of our product candidates and to package, label and ship these supplies. We expect to rely on third party contractors to manufacture, formulate, package, label and distribute commercial quantities of any product candidate

that we commercialize following approval for marketing by applicable regulatory authorities. Reliance on such third party contractors entails risks, including:

- manufacturing delays, including if our third party contractors give greater priority to the supply of other products over our product candidates or if they otherwise do not satisfactorily perform according to the terms of the agreements between us and them;

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

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

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

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

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

RISKS RELATED TO OUR INTELLECTUAL PROPERTY

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

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our proprietary product candidates. If we do not adequately protect our intellectual property,

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

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

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

Assuming the other requirements for patentability are met, currently, the first to file a patent application is generally entitled to the patent. However, prior to March 16, 2013, in the United States, the first to invent was entitled to the patent. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore we cannot be certain that we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file for patent protection of such inventions.

We may also become involved in opposition, derivation, reexamination, post grant review, inter partes review or interference proceedings, in the United States or elsewhere, challenging our patent rights or the patent rights of others. For example, in April 2017, Incyte Corporation filed an inter parties review, or IPR, petition with the PTAB, of the U.S. PTO, challenging the validity of U.S. Patent No. 9,249,149, which claims deuterium-modified versions of ruxolitinib, including CTP-543. In October 2017, the PTAB declined to institute the IPR and in November 2017, Incyte filed a request for rehearing of the PTAB's decision. In April 2018, the PTAB granted the request and instituted the IPR. We intend to take necessary actions to vigorously defend the patent. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or product candidates and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third party patent rights.

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

Even if our patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner. Our competitors may also seek approval to market their own products similar to or otherwise competitive with our products. Alternatively, our competitors may seek to market generic versions of any approved products by submitting ANDAs to the FDA in which they claim that patents owned or licensed by us are invalid, unenforceable or not infringed. In these circumstances, we may need to defend or assert our patents, or both, including by filing lawsuits alleging patent

infringement. In any of these types of proceedings, a court or other agency with jurisdiction may find our patents invalid or unenforceable, or that our competitors are competing in a non-infringing manner. In certain territories, losses to an infringing product may not be sufficiently great to justify the costs of challenging the infringer and asserting our rights. In some situations, governments have allowed or enabled the sale of competing products that infringe a company's intellectual property. Thus, even if we have valid and nominally enforceable patents, these patents still may not provide protection against competing products or processes sufficient to achieve our business objectives.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad, including challenges through the U.S. Patent and Trademark Office post-grant review procedures. Such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. In addition, given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized.

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

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

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

Our commercial success depends, in part, on our ability to develop, manufacture, market and sell our product candidates without infringing the intellectual property and other proprietary rights of third parties. Our CTP-543 compound is based, and potential future product candidates may be based, on products that are covered by issued patents or patent applications, the holders of which may attempt to assert claims against us. To date, we are not aware of any judicial decision holding that a patent that covers a non-deuterated compound should be construed to also cover deuterated analogs thereof, absent specific claims with respect to the deuterated analogs. However, any such judicial decision, or legal proceedings asserting such claims, could increase the likelihood of potential infringement claims being asserted against us. If any third party patents or patent applications are found to cover our product candidates or their methods of use, we may not be free to manufacture or market our product candidates as planned without obtaining a license, which may not be available on commercially reasonable terms, or at all.

For example, CTP-543 is a deuterium-modified version of ruxolitinib. Ruxolitinib is marketed in the U.S. by Incyte Corporation under the name Jakafi. Incyte has patents covering ruxolitinib that may be unexpired if and when we seek marketing approval for CTP-543. Incyte also has US patent 9,662,335 that broadly claims deuterated analogs of ruxolitinib. On June 27, 2017, we filed a Post Grant Review with the Patent Trial and Appeal Board, or PTAB, seeking to invalidate all claims of Incyte's U.S. Patent No. 9,662,335, which includes claims relating to deuterated ruxolitinib analogs. In January 2018, the PTAB rejected our petition to challenge the validity of the '335 patent. In

February 2018, we filed a request for reconsideration of the PTAB's decision and in May 2018, the request was denied. In addition, Columbia University is the assignee of a patent claiming the use of ruxolitinib for the treatment of hair loss disorders, including alopecia areata, which may be unexpired if and when we seek marketing approval for CTP-543. If we have to defend ourselves in a patent infringement suit, we may incur significant expenses in doing so. Such litigation could delay our ability to market, or prevent us from marketing, CTP-543.

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

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

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

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

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

RISKS RELATED TO REGULATORY APPROVAL AND OTHER LEGAL COMPLIANCE MATTERS

Even if we complete the necessary nonclinical studies and clinical trials the marketing approval process is expensive, time consuming and uncertain and we may not obtain approvals for the commercialization of some or all of our

product candidates. As a result, we cannot predict when or if, and in which territories, we, or our collaborators, will obtain marketing approval to commercialize a product candidate.

The research, testing, manufacturing, labeling, approval, selling, marketing, promotion and distribution of drug products are subject to extensive regulation by the FDA and comparable foreign regulatory authorities, which regulations differ from

country to country. Failure to obtain marketing approval for a product candidate in a given territory will prevent us and our collaborators from commercializing the product candidate in that territory. Our product candidates are in various stages of development and are subject to the risks of failure inherent in drug development. We, and our collaborators, have not submitted an application for or received marketing approval for any of our product candidates in the United States or in any other jurisdiction. We have limited experience in filing and supporting the applications necessary to gain marketing approvals.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Recently enacted and future legislation may increase the difficulty and cost for us and our collaborators to obtain marketing approval of and commercialize our product candidates and affect the prices we, or they, may obtain.
In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates,

restrict or regulate post-approval activities and affect our ability, or the ability of our collaborators, to profitably sell any products for which we, or they, obtain marketing approval.

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

In March 2010, President Obama signed into law the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, or collectively the PPACA.

Among the provisions of the PPACA of potential importance to our product candidates are the following:

- an annual, non-deductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- expansion of healthcare fraud and abuse laws, including the False Claims Act and the Anti-Kickback Statute, new government investigative powers and enhanced penalties for noncompliance;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices;
- extension of manufacturers' Medicaid rebate liability;
- expansion of eligibility criteria for Medicaid programs;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program new requirements to report financial arrangements with physicians and teaching hospitals;
- a new requirement to annually report drug samples that manufacturers and distributors provide to physicians; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

In addition, other legislative changes have been proposed and adopted since the PPACA was enacted. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, starting in 2013. In January 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding.

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

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

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

and state healthcare laws and regulations in the U.S. include the following:

- Anti-Kickback Statute. The federal healthcare anti-kickback statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in

kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation or arranging of, any good or service, for which payment may be made under a federal healthcare program such as Medicare and Medicaid;

- False Claims Act. The federal False Claims Act imposes criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for, among other things, knowingly presenting, or causing to be presented false or fraudulent claims for payment by a federal healthcare program or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government, with potential liability including mandatory treble damages and significant per-claim penalties, currently set at $5,500 to $11,000 per false claim;
- HIPAA. The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services, and, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms and technical safeguards, with respect to maintaining the privacy, security and transmission of individually identifiable health information;
- Transparency Requirements. Federal laws require applicable manufacturers of covered drugs to report payments and other transfers of value to physicians, other healthcare providers and teaching hospitals, as well as ownership and investment interests held by physicians and other healthcare providers and their immediate family members;
- Controlled Substances Act. The CSA regulates the handling of controlled substances such as JZP-386; and
- Analogous State and Foreign Laws. Analogous state and foreign fraud and abuse laws and regulations, such as state anti-kickback and false claims laws can apply to sales or marketing arrangements and claims involving healthcare items or services. In addition, some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures and govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Some state laws require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures. State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of products from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. From time to time, our operations may involve the use of hazardous materials, including chemicals and biological materials, and may also produce hazardous waste products. Even if we contract with third parties for the disposal of these

materials and waste products, we cannot completely eliminate the risk of contamination or injury resulting from these materials. In the event of contamination or injury resulting from the use or disposal of our hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

We maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, but this insurance may not provide adequate coverage against

potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Current or future envi