UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(Mark One)

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

For the quarterly period ended March 31, 2022

or

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

For the transition period from _____ to _____

Commission File Number 001-36310

CONCERT PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**20-4839882**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
65 Hayden Avenue, Suite 3000N Lexington, Massachusetts	**02421**
(Address of principal executive offices)	**(Zip Code)**

(781) 860-0045

(Registrant's telephone number, including area code)

(Former name, former address and former fiscal year, if changed since last report)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.001 per share	CNCE	Nasdaq Global Market

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

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

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

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

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

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

The number of shares outstanding of the registrant's common stock as of May 2, 2022: 36,329,342

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REFERENCES TO CONCERT

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

FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this Quarterly Report on Form 10-Q, including statements regarding our strategy, future operations, future financial position, projected costs, prospects, plans and objectives of management, are forward-looking statements. The words "anticipate," "believe," "continue," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "target," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

The forward-looking statements in this Quarterly Report on Form 10-Q include, among other things, statements about:

- ongoing and planned clinical trials for our product candidates, whether conducted by us or by our collaborators, including the timing of initiation, enrollment and completion of these trials and of the anticipated results;
- our plans to identify, develop and commercialize novel small molecule drugs based on our knowledge of deuterium chemistry;
- our plans to enter into collaborations for the development and commercialization of product candidates;
- our expected benefits from our current and any future collaboration, development or license arrangements;
- our ability to receive research and development funding and achieve anticipated milestones under our collaborations;
- our expectations regarding any future milestone payments or royalties we may receive as part of our agreement with Avanir Pharmaceuticals, Inc. with respect to AVP-786 and payments from our other collaboration and license arrangements;
- the timing of and our ability to obtain and maintain marketing approvals for our product candidates;
- the rate and degree of market acceptance and clinical utilization of our products;
- our commercialization, marketing and manufacturing capabilities and strategy;
- our intellectual property position and strategy;
- the outcome of our inter partes review proceeding regarding U.S. Patent No. 9,249,149 covering CTP-543 and the post grant review petition challenging U.S. Patent No. 10,561,659 covering CTP-543;
- our freedom to operate with respect to third-party patents;
- the potential advantages of our product candidates;
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing;
- conditions and events that raise doubt about our ability to continue as a going concern;
- risks associated with the COVID-19 pandemic, which may adversely impact our business, clinical trials and supply chain;
- developments relating to our competitors and our industry; and
- the impact of government laws and regulations.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this Quarterly Report on Form 10-Q, particularly in Part II, Item 1A. Risk Factors, that could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures, collaborations or investments that we may make.

You should read this Quarterly Report on Form 10-Q and the documents that we have filed as exhibits to this Quarterly Report on Form 10-Q completely and with the understanding that our actual future results may be materially different from

what we expect. We do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

SUMMARY OF THE MATERIAL RISKS ASSOCIATED WITH OUR BUSINESS

Our business is subject to numerous risks and uncertainties, including those described in the "Risk Factors" section in Part II, Item 1A. of this Quarterly Report on Form 10-Q. The principal risks and uncertainties affecting our business include the following:

- Our business may be adversely affected by the ongoing COVID-19 pandemic.
- We have incurred significant losses since inception, expect to incur losses for at least the next several years and may never sustain profitability.
- Based on our current operating plan, there is substantial doubt regarding our ability to continue as a going concern.
- We will need substantial additional funding. If we are unable to raise capital when needed or on favorable terms, we could be forced to delay, reduce or eliminate our development programs or commercialization efforts.
- Raising additional capital may cause dilution to our stockholders or require us to relinquish rights to our technologies or product candidates.
- Clinical drug development involves a lengthy and expensive process with an uncertain outcome.
- 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.
- 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.
- 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.
- If we, or our collaborators, experience delays or difficulties in the enrollment of patients in clinical trials, our, or their, receipt of necessary marketing approvals could be delayed or prevented.
- 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.
- 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 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 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.
- 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.
- 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.
- 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, or that the product candidates will not be of sufficient quality or reproducibility or produced on our desired schedule, which could delay, prevent or impair our development or commercialization efforts.

- 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.
- Even if we, or our collaborators, obtain marketing approvals for our product candidates, the approved labeling may include significant safety warnings or use limitations, which could adversely affect the degree of market acceptance.
- We face substantial competition from other pharmaceutical and biotechnology companies and our operating results may suffer if we fail to compete effectively.

The summary risk factors described above should be read together with the text of the full risk factors below, in the section entitled “Risk Factors” and the other information set forth in this Quarterly Report on Form 10-Q, including our consolidated financial statements and the related notes, as well as in other documents that we file with the Securities and Exchange Commission. The risks summarized above or described in full below are not the only risks that we face. Additional risks and uncertainties not precisely known to us, or that we currently deem to be immaterial may also materially adversely affect our business, financial condition, results of operations and future growth prospects.

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)

	March 31, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 59,363	$ 141,636
Investments, available for sale	49,643	—
Marketable equity securities	899	1,463
Interest receivable	251	—
Deferred offering costs	—	15
Accounts receivable	744	218
Prepaid expenses and other current assets	3,868	6,997
Total current assets	114,768	150,329
Property and equipment, net	5,015	5,242
Restricted cash	1,157	1,157
Other assets	2	3
Operating lease right-of-use asset, long-term	8,469	8,585
Total assets	$ 129,411	$ 165,316
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 2,755	$ 2,606
Accrued expenses and other liabilities	11,111	12,359
Lease liability, current portion	1,216	1,155
Total current liabilities	15,082	16,120
Accrued expenses, net of current portion	—	28
Deferred revenue, long-term	7,595	7,595
Lease liability, net of current portion	13,574	13,910
Warrant liabilities, long-term (Note 13)	16,594	15,438
Total liabilities	52,845	53,091
Commitments (Note 11)		
Stockholders' equity:		
Preferred stock, $0.001 par value per share; 5,000,000 shares authorized; 32,500 shares designated as Series X1; 13,997 shares of Series X1 issued and outstanding as of March 31, 2022 and December 31, 2021, respectively	—	—
Common stock, $0.001 par value per share; 100,000,000 shares authorized; 35,153,943 and 34,939,628 shares issued and 34,953,342 and 34,739,027 shares outstanding as of March 31, 2022 and December 31, 2021, respectively	34	34
Additional paid-in capital	463,876	461,765
Accumulated other comprehensive loss	(118)	(76)
Accumulated deficit	(387,226)	(349,498)
Total stockholders' equity	76,566	112,225
Total liabilities and stockholders' equity	$ 129,411	$ 165,316

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 March 31,	
	2022	**2021**
Revenue:		
License and research and development revenue	$ —	$ 5
Operating expenses:		
Research and development	30,489	18,500
General and administrative	5,539	5,485
Total operating expenses	36,028	23,985
Loss from operations	(36,028)	(23,980)
Investment income	20	25
Unrealized (loss) gain on marketable equity securities	(564)	1,286
Unrealized loss on warrant liabilities (Note 13)	(1,156)	—
Net loss	$ (37,728)	$ (22,669)
Other comprehensive loss:		
Unrealized loss on investments, available for sale	(42)	(16)
Comprehensive loss	$ (37,770)	$ (22,685)
Net loss per share applicable to common stockholders - basic and diluted	$ (1.03)	$ (0.67)
Weighted-average number of common shares used in net loss per share applicable to common stockholders - basic and diluted	36,687	33,894

See accompanying notes.

CONCERT PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (UNAUDITED)

Three Months Ended March 31, 2022

	Preferred Stock		Common Stock			Additional paid-in capital	Accumulated other comprehensive loss	Accumulated deficit	Total stockholders' equity
	Issued	Amount	Issued	In Treasury	Amount				
	(Amounts in thousands)								
Balance at December 31, 2021	14	$ —	34,938	200	$ 34	$ 461,765	$ (76)	$ (349,498)	$ 112,225
Release of restricted stock units	—	—	216	—	—	—	—	—	—
Unrealized loss on short-term investments	—	—	—	—	—	—	(42)	—	(42)
Stock-based compensation expense	—	—	—	—	—	2,111	—	—	2,111
Net loss	—	—	—	—	—	—	—	(37,728)	(37,728)
Balance at March 31, 2022	14	$ —	35,154	200	$ 34	$ 463,876	$ (118)	$ (387,226)	$ 76,566

Three Months Ended March 31, 2021

	Preferred Stock		Common Stock			Additional paid-in capital	Accumulated other comprehensive loss	Accumulated deficit	Total stockholders' equity
	Issued	Amount	Issued	In Treasury	Amount				
	(Amounts in thousands)								
Balance at December 31, 2020	—	$ —	32,063	200	$ 31	$ 400,636	$ (58)	$ (269,447)	$ 131,162
Exercise of stock options	—	—	10	—	—	89	—	—	89
Release of restricted stock units	—	—	136	—	—	—	—	—	—
Unrealized loss on short-term investments	—	—	—	—	—	—	(16)	—	(16)
Stock-based compensation expense	—	—	—	—	—	3,431	—	—	3,431
Proceeds from at-the-market offering, net of issuance costs	—	—	165	—	—	2,042	—	—	2,042
Net loss	—	—	—	—	—	—	—	(22,669)	(22,669)
Balance at March 31, 2021	—	$ —	32,374	200	$ 31	$ 406,198	$ (74)	$ (292,116)	$ 114,039

See accompanying notes.

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

	Three Months Ended March 31,	
	2022	2021
Operating activities		
Net loss	$ (37,728)	$ (22,669)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	321	392
Stock-based compensation expense	2,111	3,431
Amortization of premiums on investments	172	29
Unrealized loss (gain) on marketable equity securities	564	(1,286)
Unrealized loss on warrant liabilities	1,156	—
Non-cash lease expense	116	84
Changes in operating assets and liabilities:		
Accounts receivable	(526)	74
Deferred offering costs	15	—
Interest receivable	(251)	118
Prepaid expenses and other current assets	3,129	1,243
Other assets	1	19
Accounts payable	147	278
Accrued expenses and other liabilities	(1,276)	(2,206)
Operating lease liability	(275)	(221)
Net cash used in operating activities	(32,324)	(20,714)
Investing activities		
Purchases of property and equipment	(92)	(92)
Purchases of investments	(49,857)	—
Maturities of investments	—	30,712
Net cash (used in) provided by investing activities	(49,949)	30,620
Financing activities		
Proceeds from exercise of stock options	—	89
Proceeds from at-the-market offering, net of issuance costs	—	2,575
Net cash provided by financing activities	—	2,664
Net (decrease) increase in cash, cash equivalents and restricted cash	(82,273)	12,570
Cash, cash equivalents and restricted cash at beginning of period	142,793	78,359
Cash, cash equivalents and restricted cash at end of period	$ 60,520	$ 90,929
Supplemental cash flow information:		
Purchases of property and equipment unpaid at period end	$ 3	$ 3
Cash paid included in measurement of lease liabilities	$ 764	$ 742

See accompanying notes.

1. Nature of Business

Concert Pharmaceuticals, Inc., or the Company, was incorporated on April 12, 2006 as a Delaware corporation and has its operations based in Lexington, Massachusetts. The Company is a late-stage clinical biopharmaceutical company that is developing CTP-543, a Janus Kinase 1 and Janus Kinase 2 (JAK 1/2) inhibitor that it discovered through the application of its deuterated chemical entity platform, or DCE Platform®. As discussed in detail in the "Overview" section in Part I, Item 2. of this Quarterly Report on Form 10-Q, the Company is evaluating CTP-543 in a Phase 3 clinical program for the treatment of alopecia areata, a serious autoimmune dermatological condition.

Liquidity and Going Concern

As of March 31, 2022, the Company had cash, cash equivalents and investments of $109.0 million and net working capital of $99.7 million. The Company has incurred cumulative net losses of $387.2 million since inception and requires capital to continue future development activities. The Company does not have any products approved for sale and has not generated any revenue from product sales. The Company has financed its operations primarily through the public offering and private placement of its equity, debt financing, funding from collaborations and patent assignments, asset sales and other arrangements. The Company expects its expenses to increase in connection with its ongoing activities, particularly as it conducts its Phase 3 clinical program of CTP-543 in alopecia areata and seeks marketing approval for CTP-543. For information regarding the Company's recent equity financings, see Notes 12 and 13.

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.

Under Accounting Standards Codification, or ASC, Topic 205-40, *Presentation of Financial Statements - Going Concern*, management is required at each reporting period to evaluate whether there are conditions and events, considered in the aggregate, that raise substantial doubt about an entity's ability to continue as a going concern within one year after the date that the financial statements are issued. This evaluation initially does not take into consideration the potential mitigating effect of management's plans that have not been fully implemented as of the date the financial statements are issued. When substantial doubt exists, management evaluates whether the mitigating effect of its plans sufficiently alleviates the substantial doubt about the entity's ability to continue as a going concern. The mitigating effect of management's plans, however, is only considered if both (i) it is probable that the plans will be effectively implemented within one year after the date that the financial statements are issued and (ii) it is probable that the plans, when implemented, will mitigate the relevant conditions or events that raise substantial doubt about the entity's ability to continue as a going concern within one year after the date that the financial statements are issued. Generally, to be considered probable of being effectively implemented, the plans must have been approved by the entity's board of directors before the date that the financial statements are issued.

Successful completion of the Company's development program and, ultimately, the attainment of profitable operations are dependent upon future events, including obtaining adequate financing to support the Company's cost structure and operating plan. Management's plans to alleviate its financing requirements include, among other things, pursuing one or more of the following steps to raise additional capital, none of which can be guaranteed or are entirely within the Company's control:

- raise funding through the sale of the Company's common or preferred stock;
- raise funding through debt financing; and
- establish collaborations with potential partners to advance the Company's product pipeline.

Based on the Company's current operating plan, management believes that its current cash, cash equivalents and investments will allow the Company to meet its liquidity requirements into the fourth quarter of 2022. The Company's history of significant losses, its negative cash flows from operations, its limited liquidity resources currently on hand and its dependence on its ability to obtain additional financing to fund its operations after the current resources are exhausted, about which there can be no certainty, have resulted in management's assessment that there is substantial doubt about the Company's ability to continue as a going concern for a period of at least twelve months from the issuance date of this Quarterly Report on Form 10-Q. The accompanying condensed consolidated financial statements have been prepared on a going concern basis, which contemplates

the realization of assets and the satisfaction of liabilities in the normal course of business, and do not include any adjustments that may result from the outcome of this uncertainty.

If the Company is unable to raise capital when needed or on acceptable terms, or if it is unable to procure collaboration arrangements to advance its programs, the Company would be forced to discontinue some of its operations or develop and implement a plan to further extend payables, reduce overhead or scale back its current operating plan until sufficient additional capital is raised to support further operations. There can be no assurance that such a plan would be successful.

2. Basis of Presentation and Significant Accounting Policies

Basis of Presentation

The 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 months ended March 31, 2022 are not necessarily indicative of the results that may be expected for the fiscal year ending December 31, 2022 or any other future period.

The accompanying condensed consolidated financial statements reflect the accounts of the Company 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 fiscal year ended December 31, 2021 filed with the Securities and Exchange Commission, or SEC, on March 3, 2022.

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

Use of Estimates and Summary of Significant Accounting Policies

The preparation of the consolidated financial statements in conformity with U.S. generally accepted accounting principles 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; prepaid and accrued research and development expenses; stock-based compensation expense; fair value of warrant liabilities; 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.

During the three months ended March 31, 2022, 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, 2021.

Recently Adopted Accounting Pronouncements

In August 2020, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update, or ASU, 2020-06, *Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*. ASU 2020-06 simplifies the accounting for certain financial instruments with characteristics of liabilities and equity, including convertible instruments and contracts in an entity's own stock, by eliminating the cash conversion and beneficial conversion feature accounting models for convertible debt and convertible preferred stock. Additionally, ASU 2020-06 eliminates the treasury stock method to calculate diluted earnings per share for convertible instruments. ASU 2020-06 is effective for public business entities for fiscal years beginning after December 15, 2021 and interim periods within those fiscal years, or December 31, 2023 and interim periods within those fiscal years for companies who meet the SEC definition of smaller reporting company. Early adoption is permitted, and entities are allowed to adopt the guidance through either a modified retrospective method of transition or a fully retrospective method of

transition. The Company early adopted this standard effective January 1, 2022 on a modified retrospective basis, and it did not have a material effect on the condensed consolidated financial statements and related disclosures.

Pending Accounting Pronouncements

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments-Credit Losses*. This 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. As a smaller reporting company, ASU 2016-13 will become effective for the Company for fiscal years beginning after December 15, 2022, and early adoption is permitted. The Company is currently evaluating the impact that ASU 2016-13 will have on its financial statements and related disclosures.

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 March 31, 2022 and December 31, 2021 and indicate the level within the fair value hierarchy where each measurement is classified. The carrying amounts reflected in the condensed consolidated balance sheets for cash, prepaid expenses and other current assets, restricted cash, accounts payable and accrued expenses approximate their fair value due to their short-term nature.

	Level 1	Level 2	Level 3	Total
March 31, 2022				
Cash equivalents:				
Money market funds	$ 44,940	$ —	$ —	$ 44,940
Investments, available for sale:				
U.S. Treasury obligations	49,643	—	—	49,643
Marketable equity securities:				
Corporate equity securities	899	—	—	899
Total	$ 95,482	$ —	$ —	$ 95,482
Warrant liabilities (Note 13)	$ —	$ 16,594	$ —	$ 16,594

	Level 1	Level 2	Level 3	Total
December 31, 2021				
Cash equivalents:				
Money market funds	$ 132,850	$ —	$ —	$ 132,850
Marketable equity securities:				
Corporate equity securities	1,463	—	—	1,463
Total	$ 134,313	$ —	$ —	$ 134,313
Warrant liabilities (Note 13)	$ —	$ 15,438	$ —	$ 15,438

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. 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 (loss) income. 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 as of March 31, 2022 and December 31, 2021:

	Average Maturity	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
March 31, 2022					
Cash		$ 14,423	$ —	$ —	$ 14,423
Money market funds		44,940	—	—	44,940
Total cash and cash equivalents		$ 59,363	$ —	$ —	$ 59,363
U.S. Treasury obligations	87 days	$ 49,685	$ —	$ (42)	$ 49,643
Total investments, available for sale		$ 49,685	$ —	$ (42)	$ 49,643

March 31, 2022	Acquisition Value	Unrealized Gains	Unrealized Losses	Fair Value
Marketable equity securities	$ 10,451	$ —	$ (9,552)	$ 899

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2021				
Cash	$ 8,786	$ —	$ —	$ 8,786
Money market funds	132,850	—	—	132,850
Total cash and cash equivalents	$ 141,636	$ —	$ —	$ 141,636

December 31, 2021	Acquisition Value	Unrealized Gains	Unrealized Losses	Fair Value
Marketable equity securities	$ 10,451	$ —	$ (8,988)	$ 1,463

Although available to be sold to meet operating needs or otherwise, securities are generally held through maturity. The Company classifies all investments as current assets, as these assets are readily available for use in current operations. The cost of securities sold is determined based on the specific identification method for purposes of recording realized gains and losses. During 2022 and 2021, there were no realized gains or losses on sales of investments, and no investments were adjusted other than for temporary declines in fair value.

5. Restricted Cash

Restricted cash as of March 31, 2022 and 2021 was held as collateral for stand-by letters of credit issued by the Company to its landlord in connection with the current lease for its principal facilities located at 65 Hayden Avenue, Lexington, Massachusetts, or the Premises. For additional information regarding the Company's lease, refer to Note 11. Cash, cash equivalents and restricted cash consisted of the following as of March 31, 2022 and 2021:

	March 31, 2022	March 31, 2021
Cash and cash equivalents	$ 59,363	$ 89,772
Restricted cash	1,157	1,157
Total cash, cash equivalents and restricted cash shown in the statements of cash flows	$ 60,520	$ 90,929

6. Accrued Expenses and Other Liabilities

Accrued expenses and other liabilities consisted of the following as of March 31, 2022 and December 31, 2021:

	March 31, 2022	December 31, 2021
Accrued professional fees and other	$ 617	$ 1,094
Employee compensation and benefits	874	3,617
Research and development expenses	9,620	7,648
Accrued expenses and other liabilities	$ 11,111	$ 12,359
Employee compensation and benefits, net of current portion	$ —	$ 28
Accrued expenses and other liabilities, net of current portion	$ —	$ 28

7. 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 U.S. Internal Revenue Code, or the Code. Net operating loss and tax credit carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant stockholders over a three-year period in excess of 50%, 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 March 31, 2022, the Company forecasts an ordinary pre-tax loss for the year ended December 31, 2022 and, since it maintains a full valuation allowance on its deferred tax assets, the Company did not record an income tax benefit relating to this period.

The Company adopted ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*, effective January 1, 2020. Under ASU 2019-12, the Company, having a full valuation and a loss in continuing operations, will no longer include the impacts of items in other comprehensive income in determining intra-period allocation of tax expense for continuing operations. Under ASU 2019-12, the Company can apply this change to intra-period tax allocation on a prospective basis. For the three months ended March 31, 2022, the Company applied the tax allocation rules of ASU 2019-12 to the $42 thousand of

unrealized losses on available-for-sale investments recognized in other comprehensive loss, which did not have a material impact on the consolidated financial statements or related disclosures.

Effective for tax years beginning on or after January 1, 2022, research and experimental expenditures under Section 174 of the Code must be capitalized over five years when performed in the United States and over 15 years when performed outside of the United States. The modification is an accounting method change that will require the filing of Form 3115 with the Company's 2022 tax return. As of March 31, 2022, the Company has performed a high-level analysis of the impact of this legislation and determined that the Company's projected loss position for 2022 does not result in income tax. The Company maintains its full valuation allowance.

8. Revenue

The Company's revenue is generated through collaborative licensing agreements, patent assignments, intellectual property sales and asset sales. The Company generates its revenue through one segment. The revenue recognized under each of the Company's arrangements during the current and prior periods is described below.

Contract Assets

The Company did not have a contract asset as of March 31, 2022 or December 31, 2021.

Contract Liabilities

As of March 31, 2022 and December 31, 2021, the Company had $2.8 million in contract liabilities 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 non-current based on the timing of when the Company expects to recognize revenue. The $2.8 million in contract liabilities consisted of deferred revenue related to a payment received from GlaxoSmithKline that the Company will not recognize as revenue until all repayment obligations lapse.

Revenue Arrangements

Vertex

In July 2017, the Company completed the sale of worldwide development and commercialization rights to CTP-656, now known as VX-561, and other assets related to the treatment of cystic fibrosis to Vertex Pharmaceuticals, Inc., or Vertex. Pursuant to the Asset Purchase Agreement with Vertex, or the Vertex Agreement, the Company received $160.0 million in cash upon closing. Additionally, upon the achievement of certain milestone events, Vertex agreed to pay the Company an aggregate of up to $90.0 million, or the Milestone Obligation.

In May 2021, the Company entered into an amendment to the Vertex Agreement, or the Vertex Amendment. Pursuant to the Vertex Amendment, Vertex paid the Company $32.0 million in cash in exchange for the removal of the Milestone Obligation. As a result of the Vertex Amendment, the Company is not entitled to receive any further payments pursuant to the Vertex Agreement.

The Vertex Amendment changed the future obligations due from Vertex under the Vertex Agreement and was therefore treated as a contract modification. Since the Vertex Amendment does not provide for any new distinct goods and services and the single performance obligation related to the arrangement was previously satisfied, the Company recognized the $32.0 million payment from Vertex as Other Revenue during the year ended December 31, 2021.

Previously, the variable consideration related to the Milestone Obligation was considered fully constrained due to the uncertainty associated with the achievement of the milestones. Pursuant to the Vertex Amendment, Vertex is no longer obligated to make these future milestone payments, and as a result, they are no longer considered variable consideration. There are no performance obligations or variable consideration remaining associated with the Vertex Agreement.

9. 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 March 31, 2022, the Company has granted awards in the form of stock options and restricted stock units, or RSUs. The stock options generally have been granted with an exercise price equal to the closing market price of the Company's common stock on the date of grant, a vesting period of one, three or four years, and an expiration date no later than ten years from the date of grant. The Company has granted performance-based RSUs and service-based RSUs with a vesting period of one, two or three years.

Effective January 1, 2022, an additional 1,389,561 shares of common stock were added to the Company's 2014 Stock Incentive Plan, or the 2014 Plan, for future issuance pursuant to the terms of the 2014 Plan. As of March 31, 2022, there were 2,026,725 shares of common stock available for future awards 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 March 31,	
	2022	2021
Research and development	$ 950	$ 1,851
General and administrative	1,161	1,580
Total stock-based compensation expense	$ 2,111	$ 3,431

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 months ended March 31, 2022 and 2021 reflect the following weighted-average assumptions:

	Three Months Ended March 31,	
	2022	2021
Expected volatility	70.33%	69.71%
Expected term	6.0 years	6.0 years
Risk-free interest rate	2.33%	0.54%
Expected dividend yield	—%	—%

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

	Three Months Ended March 31,	
	2022	2021
	(Amounts in thousands, except per share data)	
Weighted-average fair value of options granted, per option	$ 2.47	$ 7.87
Aggregate grant date fair value of options vested during the period	$ 1,909	$ 2,066
Total cash received from exercises of stock options	$ —	$ 89
Total intrinsic value of stock options exercised	$ —	$ 42

The following is a summary of stock option activity for the three months ended March 31, 2022:

	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, 2021	5,197,320	$ 14.21		
Granted	29,200	$ 3.88		
Exercised	—	$ —		
Forfeited or expired	(178,506)	$ 15.70		
Outstanding at March 31, 2022	5,048,014	$ 14.09	5.8	$ 2
Exercisable at March 31, 2022	3,985,474	$ 14.72	5.2	$ 2
Vested and expected to vest at March 31, 2022 [1]	4,968,980	$ 14.13	5.8	$ 2

[1] Represents the number of vested stock option shares as of March 31, 2022, plus the number of unvested stock option shares that the Company estimated as of March 31, 2022 would vest, based on the unvested stock option shares as of March 31, 2022 and an estimated forfeiture rate of 7%.

As of March 31, 2022, there was $7.0 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 2.1 years.

Restricted Stock Units

On February 14, 2020, or the 2020 RSU grant date, the Company granted 0.4 million RSUs, or the 2020 RSUs, to certain officers and employees. All of the 2020 RSUs are service-based and vest ratably over three years, with one third of the 2020 RSUs vesting on each anniversary of the 2020 RSU grant date through February 14, 2023.

On January 5, 2021, or the January 2021 RSU grant date, the Company granted 0.3 million RSUs, or the January 2021 RSUs, to certain officers and employees. All of the January 2021 RSUs are service-based and vest ratably over three years, with one third of the January 2021 RSUs vesting on each anniversary of the January 2021 RSU grant date through January 5, 2024.

On June 10, 2021, or the June 2021 RSU grant date, the Company granted 0.2 million RSUs, or the June 2021 RSUs, to directors and certain employees. All of the June 2021 RSUs are service-based, with half of the grants to employees vesting six months after the June 2021 RSU grant date and the remainder vesting on the first anniversary of the June 2021 RSU grant date, and the grants to directors vesting on the earlier of the first anniversary of the June 2021 RSU grant date or one day prior to the Company's 2022 annual meeting of stockholders.

On January 28, 2022, or the 2022 RSU grant date, the Company granted 0.7 million RSUs, or the 2022 RSUs, to certain officers and employees. All of the 2022 RSUs are service-based and vest ratably over three years, with one third of the 2022 RSUs vesting on each anniversary of the 2022 RSU grant date through January 28, 2025.

Also on the 2022 RSU grant date, the Company granted 0.3 million performance-based RSUs, or the 2022 PSUs, to certain officers and employees. The 2022 PSUs vest as to the total number of shares granted one business day after the date on which the U.S. Food and Drug Administration, or FDA, notifies the Company that it has accepted for filing a New Drug Application, or NDA, for CTP-543, provided that the date of acceptance is on or before October 31, 2023. The Company is using the straight-line method to recognize expense over the requisite service period based on its estimate of the number of 2022 PSUs that will vest. If there is a change in the estimate of the number of 2022 PSUs 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 have vested and settled. As of March 31, 2022, 0.3 million of the 2020 RSUs, 0.1 million of the January 2021 RSUs and 0.1 million of the June 2021 RSUs had vested. The fair value of an RSU is measured based on the market price of the underlying common stock on the date of grant.

The following is a summary of RSU activity for the three months ended March 31, 2022:

	Number of RSUs	Weighted-Average Grant Date Fair Value
Outstanding at December 31, 2021	628,192	$ 10.78
Granted	1,005,575	$ 2.89
Released	(214,315)	$ 11.81
Forfeited	(29,992)	$ 9.40
Outstanding at March 31, 2022	1,389,460	$ 4.94

As of March 31, 2022, there was $5.2 million of unrecognized compensation cost related to RSUs that are expected to vest. The RSU costs are expected to be recognized over a weighted-average remaining vesting period of 2.1 years.

10. Loss Per Share

Basic net loss per common share is calculated by dividing net loss allocable to common stockholders by the weighted-average common shares outstanding during the period, without consideration of stock options, RSUs or preferred stock as common stock equivalents. The weighted-average common shares outstanding as of March 31, 2022 and 2021 includes pre-funded warrants to purchase up to an aggregate of 1.8 million shares of common stock that were issued in connection with a financing in 2020. For purposes of the diluted net loss per share calculation, common stock equivalents are excluded from the calculation if their effect would be anti-dilutive. As such, basic and diluted net loss per share applicable to common stockholders are the same for periods with a net loss.

The following table illustrates the determination of loss per share for each period presented.

	Three Months Ended March 31,	
	2022	2021
	(Amounts in thousands, except per share amounts)	
Numerator:		
Net loss applicable to common stockholders - basic and diluted	$ (37,728)	$ (22,669)
Denominator:		
Weighted-average shares outstanding - basic and diluted	36,687	33,894
Net loss per share applicable to common stockholders - basic and diluted	$ (1.03)	$ (0.67)
Anti-dilutive potential common stock equivalents excluded from the calculation of net loss per share:		
Stock options	5,048	5,366
Restricted stock units	1,389	822
Warrants	16,311	61
Series X1 Preferred Stock	13,997	—

11. Commitments

Lease

The Company currently has a lease, or the Lease, for approximately 56,000 square feet of office and laboratory space located at the Premises. The Lease is classified as an operating lease. The lease term extends ten years following January 1, 2019. The Company is entitled to two five-year options to extend the Lease. The Lease provides for annual base rent of approximately $2.8 million in the first year following January 1, 2019, which increases on a yearly basis by 3.0% (subject to an abatement of base rent of approximately $0.5 million at the beginning of the second year of the lease term). There are no variable payments, exercise purchase options, penalties, fees or residual value guarantees under the Lease. The Company is also obligated to pay the landlord for certain costs, taxes and operating expenses related to the Premises, subject to certain exclusions.

The Company recorded a liability for the Lease of $16.9 million on January 1, 2019. This lease liability is amortized over the remaining lease term in an amount equal to the difference between the cash rent paid and the monthly interest calculated on the remaining lease liability. As of March 31, 2022, the Company had a current lease liability of $1.2 million and a non-current lease liability of $13.6 million recorded in its condensed consolidated balance sheets.

On January 1, 2019, the Company recorded a right-of-use asset in the amount of $9.5 million, which represents the lease liability of $16.9 million, adjusted for previously accrued rent of $2.9 million and previously recorded unamortized lease incentives in the amount of $4.5 million. The right-of-use asset is amortized over the remaining lease term in an amount equal to the difference between the calculated straight-line expense of the total lease payments less the monthly interest calculated on the remaining lease liability. As of March 31, 2022, the Company had a long-term lease asset of $8.5 million recorded in its condensed consolidated balance sheets.

The Company recognizes lease expense, calculated as the remaining cost of the Lease allocated over the remaining lease term, on a straight-line basis. Lease expense is presented as part of continuing operations in the condensed consolidated statements of operations and comprehensive loss. For the three months ended March 31, 2022, the Company recognized $0.6 million in lease expense.

For the three months ended March 31, 2022, the Company paid $0.8 million in rent. As a payment arising from an operating lease, the $0.8 million is classified within operating activities in the condensed consolidated statements of cash flows.

For the three months ended March 31, 2022 and 2021, the weighted-average remaining lease term was 6.75 years and 7.75 years, respectively, and the weighted-average discount rate was 13.08%.

12. Open Market Sale Agreement

On March 1, 2019, the Company entered into an Open Market Sale Agreement, or the ATM Agreement, with Jefferies LLC, or Jefferies, with respect to an at-the-market offering program under which the Company may sell, from time to time at its sole discretion, shares of common stock having an aggregate offering price of up to $50.0 million, referred to as Placement Shares, through Jefferies as its sales agent. The Company will pay Jefferies a commission equal to 3.0% of the gross sales proceeds of any Placement Shares sold through Jefferies under the ATM Agreement.

On November 5, 2020, the Company entered into an amendment to the ATM Agreement with Jefferies to increase the aggregate offering price of Placement Shares that may be sold pursuant to the ATM Agreement from up to $50.0 million to up to $100.0 million. However, on March 7, 2021, the Company's ability to further use the first $50.0 million expired. As a result, after March 7, 2021, the Company may only sell up to an additional $50.0 million pursuant to the ATM Agreement.

During the year ended December 31, 2021, the Company sold 165,323 shares of common stock pursuant to the ATM Agreement for net proceeds of $2.0 million, after payment of cash commissions of 3.0% of the gross proceeds to Jefferies. Cash provided by financing activities for the three months ended March 31, 2021 includes $0.5 million in net proceeds from sales pursuant to the ATM Agreement that had been classified as a receivable as of December 31, 2020.

During the three months ended March 31, 2022, the Company did not sell any shares of common stock pursuant to the ATM Agreement.

13. 2021 Sale of Common and Preferred Stock, Warrants and Royalty Interest

In November 2021, the Company entered into a structured financing, or the 2021 Financing, consisting of a securities purchase agreement, warrant agreements, or the Warrants, and a royalty purchase agreement, or the RPA. Pursuant to the 2021 Financing, the Company received aggregate gross proceeds of $65.0 million in exchange for the sale to a select group of institutional investors, or the Investors, of (i) 2,253,000 shares of common stock, (ii) 13,997 shares of Series X1 Preferred Stock, (iii) Warrants to purchase up to 16,250 shares of Series X1 Preferred Stock and (iv) a portion of the Company's right to receive potential future AVP-786 royalties, or the Royalty Interest, under an existing development and licensing agreement, or the Avanir Agreement, with Avanir Pharmaceuticals, Inc., or Avanir, a subsidiary of Otsuka Pharmaceuticals, Co., Ltd.

Preferred Stock

In November 2021, the Company filed a certificate of designation with the Delaware Secretary of State setting forth the preferences, rights and limitations of a newly designated series of preferred stock known as "Series X1 Preferred Stock." 32,500 shares have been designated as Series X1 Preferred Stock.

The Series X1 Preferred Stock is convertible into shares of common stock at a conversion rate of 1,000 shares of common stock per share of Series X1 Preferred Stock, at the option of the holder, subject to certain limitations. Except in limited circumstances, the Series X1 Preferred Stock does not have voting rights. Holders of the Series X1 Preferred Stock are entitled to receive dividends on an as converted to common stock basis when and if declared. In any liquidation or dissolution of the Company, the Series X1 Preferred Stock will rank on parity with the common stock in the distribution of assets, to the extent legally available for distribution, and will receive any dividends declared but unpaid on such shares.

Warrants

The Warrants consisted of (i) warrants to purchase an aggregate of 8,125 shares of Series X1 Preferred Stock at an initial exercise price (on a common stock equivalent basis) of $5.34 per share, or the First Tranche Warrants, and (ii) warrants to purchase an aggregate of an additional 8,125 shares of Series X1 Preferred Stock at an initial exercise price (on a common stock equivalent basis) of $7.35 per share, or the Second Tranche Warrants. The Warrants are exercisable at any time prior to the expiration date.

The term of the First Tranche Warrants and Second Tranche Warrants is contingent on the outcome of the Company's CTP-543 THRIVE-AA1 Phase 3 clinical trial and THRIVE-AA2 Phase 3 clinical trial, respectively. The Warrants expire 90 days after the occurrence of both (i) the public disclosure by the Company of the achievement of statistical significance on each of the primary endpoints of the respective clinical trial and (ii) a determination by the Company that there are no safety or other issues that would impede the Company's filing of an NDA without first requiring an additional clinical trial that is not already contemplated by the Company's development plans for CTP-543. In the event that either event (i) or (ii) does not occur, the Warrants will expire 90 days after the earlier of (a) the public release of topline data from two ongoing Phase 3 clinical trials being conducted by Avanir in the indication of agitation in Alzheimer's disease patients and (b) written notification to the Investors that the Company has received written notice from Avanir of a decision to cease both such clinical trials early. In the event that neither event (a) nor (b) occurs, the Warrants will expire upon the tenth anniversary from issuance.

The exercise price of the Warrants is subject to a one-time adjustment in the event that the Company sells capital stock or derivative securities convertible into or exercisable for capital stock (subject to certain exemptions) at a weighted-average price per share below the initial exercise price, in which case the initial exercise price will be automatically reset upon exercise of the Warrant to an exercise price that is the midpoint between the initial exercise price and the weighted-average price per share, provided that the adjusted exercise price cannot be less than $2.88 per share.

Royalty Interest

As part of the 2021 Financing, under the RPA, the Investors purchased the Royalty Interest. Investors are initially entitled to an aggregate base amount of the future royalty payments of 35.0% in respect of worldwide net sales of licensed products under the Avanir Agreement, and may increase their percentage ownership (i) by up to 7.5% upon the exercise in full by the Investors of the First Tranche Warrants and (ii) by up to an additional 7.5% upon the exercise in full by the Investors of the Second Tranche Warrants. Upon exercise of any portion of the First Tranche Warrants and/or Second Tranche Warrants by any Investor, such Investor is entitled to receive its pro rata share of the percentages set forth in the RPA.

Accounting Treatment

The Company received aggregate net proceeds of $64.4 million from the 2021 Financing after deducting offering expenses of $0.6 million payable by the Company.

The common stock, Series X1 Preferred Stock, Warrants and Royalty Interest were determined to be freestanding instruments, as they are legally detachable and separately exercisable from each other.

The Series X1 Preferred Stock is not redeemable outside the control of the Company, and the Company has the ability to settle any conversion in shares. As such, the Series X1 Preferred Stock is classified as a component of permanent stockholders' equity within additional paid-in capital. The ability of the Series X1 Preferred Stock to be converted to common stock, or the Conversion Option, represents an embedded call option, and therefore, the Company performed an evaluation in accordance with ASC 815, *Derivatives and Hedging*, to determine whether the Conversion Option requires bifurcation as a derivative. As a result of the evaluation, the Company concluded that the Conversion Option feature is clearly and closely related to the equity host instrument and is not an embedded derivative requiring bifurcation. Additionally, the Company evaluated the Series X1 Preferred Stock for a beneficial conversion feature in accordance with ASC 470, *Debt*. The evaluation identified a beneficial conversion feature; however, because the Series X1 Preferred Stock was recorded at par value with the incremental amount recorded to additional paid-in capital, the beneficial conversion feature had no impact. As of January 1, 2022, the Company adopted ASU 2020-06. ASU 2020-06 eliminates the cash conversion and beneficial conversion feature accounting models for convertible debt and convertible preferred stock. As a result, the Company's adoption of ASU 2020-06 eliminated the beneficial conversion feature of the Series X1 Preferred Stock.

The Warrants include an exercise contingency that is based on an observable index other than the Company's own operations, and therefore, are precluded from equity classification. As a result, the Warrants are classified as a liability and measured at fair value at inception with subsequent changes in fair value recognized in earnings as further discussed below.

The Royalty Interest does not meet the debt classification criteria, and as such, is accounted for under the deferred income model to be amortized under the units of revenue method. The two options to acquire an additional 7.5% of ownership in future AVP-786 royalties, or the Royalty Step Ups, are features embedded in the Royalty Interest. The Royalty Step Ups do not require bifurcation, as they are subject to scope exception because they pertain to the sale of future revenues.

The aggregate proceeds of the 2021 Financing were first allocated to the Warrants based on fair value, with the remaining proceeds allocated to the common stock, Series X1 Preferred Stock and Royalty Interest on a relative fair value basis. The First Tranche Warrants and Second Tranche Warrants were valued using a Black-Scholes-Merton option pricing model, resulting in a fair value of $7.5 million and $5.9 million, respectively, as of the date the Company entered into the 2021 Financing. The relative fair value allocated to common stock and Series X1 Preferred Stock totaled $6.5 million and $40.3 million, respectively. The relative fair value allocated to the Royalty Interest was $4.8 million.

Warrant Fair Value Assumptions

As of March 31, 2022 and December 31, 2021, the fair value of the First Tranche Warrants was $8.8 million and $8.5 million, respectively, and Second Tranche Warrants was $7.8 million and $6.9 million, respectively. The Company estimated the fair value of the Warrants using the Black-Scholes-Merton option pricing model. The fair value assumptions related to the Warrants as of March 31, 2022 and December 31, 2021 were as follows:

	As of March 31, 2022	
	Tranche 1 Warrants	**Tranche 2 Warrants**
Expected volatility	74.42%	78.21%
Expected term	2.38 years	2.55 years
Risk-free interest rate	2.37%	2.37%
Expected dividend yield	—%	—%

	As of December 31, 2021	
	Tranche 1 Warrants	Tranche 2 Warrants
Expected volatility	75.90%	76.40%
Expected term	2.68 years	2.80 years
Risk-free interest rate	0.97%	0.97%
Expected dividend yield	—%	—%

The expected term is probability-weighted based on the anticipated terms dictated by the possible outcomes of the Warrants. The expected volatility is calculated based on the historical volatility of the Company commensurate with the expected term. The risk-free interest rate is based on the average treasury bill interest rate over a period commensurate with the expected term. The expected dividend yield is zero, as the Company has not paid any dividends to date and has no current intention of paying cash dividends.

Related Party Participation in the 2021 Financing

The Investors included RA Capital Healthcare Fund, L.P., or RA Capital. At the time of entering into the 2021 Financing, RA Capital held greater than 5% of the Company's outstanding common stock, and two members of the Company's board of directors maintained minority, non-controlling interests in RA Capital. RA Capital purchased 7,500 shares of Series X1 Preferred Stock, 7,500 Warrants and a base amount of 16.2%, which could potentially increase up to 23.1%, of the Royalty Interest for $30.0 million in cash.

As of March 31, 2022 and December 31, 2021, the Company's condensed consolidated balance sheet includes RA Capital's portion of warrant liabilities of $7.7 million and $7.1 million, respectively, and deferred revenue of $2.2 million for both periods. For the three months ended March 31, 2022, the Company's condensed consolidated statement of operations and condensed consolidated statement of cash flows include RA Capital's portion of the unrealized loss on warrant liabilities of $0.5 million.

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. Some of the information contained in this discussion and analysis or set forth elsewhere in this report, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve significant risks and uncertainties. You should read the "Risk Factors" section in Part II, Item 1A. of this Quarterly Report on Form 10-Q for a discussion of important factors that could cause our 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 late-stage clinical biopharmaceutical company that is developing CTP-543, a JAK 1/2 inhibitor that we discovered through the application of our DCE Platform. We are evaluating CTP-543 in a Phase 3 clinical program for the treatment of alopecia areata, a serious autoimmune dermatological condition. If these trials are successful, we intend to file an NDA with the FDA in the first half of 2023. There are currently no FDA-approved treatments for alopecia areata.

CTP-543

CTP-543 Opportunity

We believe that the market opportunity to treat alopecia areata within the United States is significant. Based on a recent large cross-sectional survey study, it is estimated that the current prevalence of alopecia areata in the United States may be up to approximately 1.5 million persons (Benigno M. Clinical, Cosmetic and Investigational Dermatology 2020). The study also estimates that about 43% of the alopecia areata population in the United States has 50% or greater loss of scalp hair. Given this prevalence and the substantial impact of alopecia areata on quality of life, the burden of alopecia areata within the United States is considerable. There are currently no FDA-approved treatments for alopecia areata, and we believe that the market opportunity within the United States could support multiple approved treatments.

CTP-543 is an oral JAK 1/2 inhibitor that we are developing for the treatment of moderate to severe alopecia areata. The FDA has granted CTP-543 Breakthrough Therapy designation for the treatment of adult patients with moderate to severe alopecia areata and Fast Track designation for the treatment of alopecia areata. CTP-543 is currently in Phase 3 development and could be one of the first treatments on the market if approved by the FDA.

Clinical Development of CTP-543

We have completed multiple Phase 2 clinical trials of CTP-543 for the treatment of moderate to severe alopecia areata to support the advancement of the program into Phase 3 development. In September 2019, we announced results from a Phase 2 double-blind, randomized, dose-ranging trial to evaluate three sequential doses of CTP-543 (4, 8 and 12 mg twice-daily) and a placebo control in 149 patients with moderate to severe alopecia areata. Patients treated with either 8 mg twice-daily or 12 mg twice-daily doses of CTP-543 met the primary efficacy endpoint with statistically significant differences ($p < 0.001$) relative to placebo in the percentage of patients achieving a $\geq 50\%$ relative change from baseline at 24 weeks. The 8 mg twice-daily and 12 mg twice-daily dose groups were also significantly different from placebo in the number of patients achieving $\geq 75\%$ and $\geq 90\%$ relative change in Severity of Alopecia Tool, or SALT, score between baseline at 24 weeks. A numerically but not statistically greater percentage of patients treated with the 4 mg twice-daily dose of CTP-543 met the primary efficacy endpoint. At 24 weeks, patients treated with 8 mg twice-daily and 12 mg twice-daily doses compared to placebo also rated significantly greater improvement in their alopecia areata on the Patient Global Impression of Improvement Scale. Treatment with CTP-543 was generally well tolerated. The most common side effects in the 8 mg or 12 mg twice-daily dose groups were headache, nasopharyngitis, upper respiratory tract infection, acne, nausea and low-density lipoprotein increase. One serious adverse event of facial cellulitis was reported in the 12 mg twice-daily dose group as possibly related to treatment; however, after a brief interruption, treatment continued and this patient completed the trial. No thromboembolic events were reported during the trial.

In June 2020, we released new data analyses from our Phase 2 dose-ranging trial of CTP-543 supporting the design of our Phase 3 program. The new data analyses revealed that statistically significant results were reported for the 8 mg twice-daily and 12 mg twice-daily doses of CTP-543 at more stringent response thresholds, which may be more clinically meaningful to patients, and positive findings were reported for clinician and patient reported outcome measures of scalp hair loss. At 24 weeks, 26% and 42% of patients who received CTP-543 in the 8 mg twice-daily and 12 mg twice-daily cohorts, respectively, achieved an absolute SALT score ≤ 20 ($p < 0.05$ vs. placebo), indicating a clinically-meaningful 80% or greater scalp hair present. Data from the Clinician Global Impression of Improvement scale showed 75% of clinicians rated the response in the 12

mg twice-daily cohort and 61% of clinicians rated the response in the 8 mg twice-daily cohort as "much improved" or "very much improved" at 24 weeks. For both doses, there was a statistically significant difference from placebo ($p < 0.001$).

In addition, we completed two Phase 2 clinical trials evaluating twice-daily dosing of CTP-543 compared to once-daily dosing of CTP-543. Based on the findings from those trials, we are utilizing the 8 mg twice-daily and 12 mg twice-daily doses in our ongoing clinical development program for CTP-543. The 8 mg twice-daily and 12 mg twice-daily arms of those studies provided efficacy comparable to the 8 mg twice-daily and 12 mg twice-daily arms, respectively, of our Phase 2 dose-ranging trial.

We conducted an end of Phase 2 meeting with the FDA in March 2020 and initiated the CTP-543 Phase 3 clinical program in November 2020, beginning with the THRIVE-AA1 trial. The THRIVE-AA1 trial is a double-blind, randomized, placebo-controlled clinical trial of CTP-543 to evaluate hair regrowth using the SALT score after 24 weeks of dosing in 708 adult patients with moderate to severe alopecia areata. The trial is evaluating 8 mg and 12 mg twice-daily doses of CTP-543 compared to placebo at sites in the United States, Canada and Europe. We announced the completion of enrollment of the THRIVE-AA1 trial in October 2021 and expect to report topline results in the second quarter of 2022.

In May 2021, we initiated the THRIVE-AA2 trial, which is our second Phase 3 clinical trial of CTP-543. The THRIVE-AA2 trial is a double-blind, randomized, placebo-controlled clinical trial of CTP-543 to evaluate hair regrowth using the SALT score after 24 weeks of dosing in 517 adult patients with moderate to severe alopecia areata. The trial is evaluating 8 mg and 12 mg twice-daily doses of CTP-543 compared to placebo at sites in the United States, Canada and Europe. We announced the completion of enrollment of the THRIVE-AA2 trial in January 2022 and expect to report topline results in the third quarter of 2022.

Eligible patients from our efficacy and safety studies with CTP-543 may also enroll in one of our open label, long-term extension studies. In July 2021, we provided an update showing that, relative to our Phase 2 clinical trials of CTP-543, hair regrowth using the SALT score was maintained or improved in the great majority of patients through one year of continuous dosing with 12 mg twice-daily of CTP-543.

Additional clinical trials are ongoing to support the submission of an NDA, which is currently planned for the first half of 2023.

Earlier-Stage Pipeline

We are currently assessing earlier-stage pipeline candidates as potential development candidates, including a once-daily, modified release formulation of CTP-543.

COLLABORATION PRODUCT CANDIDATES

In addition to our wholly-owned development programs, we have entered into collaborative arrangements with companies to develop deuterium-modified versions of their marketed products. Our partners are currently responsible for all development and future commercialization activities under these arrangements. In each of these collaborations, the deuterium-modified compound was independently discovered by us.

For example, in February 2012, we entered into a development and license agreement with Avanir for the worldwide rights to develop, manufacture and commercialize AVP-786. AVP-786 is a combination of deudextromethorphan hydrobromide (d6-DM) and quinidine sulfate (Q), a CYP2D6 inhibitor, being investigated for the treatment of neurologic and psychiatric disorders. In 2019, Avanir completed two Phase 3 clinical trials evaluating AVP-786 for the treatment of agitation associated with dementia of the Alzheimer’s type. The second of the Phase 3 clinical trials did not meet its primary or key secondary endpoints; however, following additional data analysis, Avanir decided to continue developing AVP-786 for the treatment of agitation associated with dementia of the Alzheimer’s type. Three additional Phase 3 clinical trials and an open label, long-term extension study for Alzheimer’s agitation are ongoing. Additionally, Avanir is conducting a Phase 2/3 clinical trial evaluating AVP-786 for the treatment of negative symptoms of schizophrenia. Under the Avanir Agreement, we received an upfront payment of $2.0 million and have received milestone payments of $6.0 million. We are eligible to earn up to $37.0 million in regulatory and commercial launch milestone payments with respect to AVP-786 and up to $125.0 million in sales-based milestone payments. Avanir is also required to pay us royalties at defined percentages ranging from the mid-single digits to low double digits below 20% on net sales of licensed products on a country-by-country basis. 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. We sold a portion of our right to receive these royalties in connection with the 2021 Financing. The Investors collectively own 35% of such royalties, with the percentage increasing incrementally up to 50% if all of the warrants issued in connection with the financing are exercised by the Investors.

ASSET PURCHASE AGREEMENT WITH VERTEX PHARMACEUTICALS FOR CTP-656

In July 2017, we completed the sale of worldwide development and commercialization rights to CTP-656, now known as VX-561, and other assets related to the treatment of cystic fibrosis to Vertex. Pursuant to the Vertex Agreement, we received $160.0 million in cash. Additionally, upon the achievement of certain milestone events, Vertex agreed to pay us an aggregate of up to $90.0 million.

In May 2021, we entered into the Vertex Amendment, pursuant to which Vertex paid us $32.0 million in cash in exchange for the removal of the Milestone Obligation. As a result of the Vertex Amendment, we are not entitled to receive any further payments pursuant to the Vertex Agreement.

COVID-19 PANDEMIC

The COVID-19 pandemic continues to evolve. We could be materially and adversely affected by the risks, or the public perception of the risks, related to an epidemic, pandemic or other public health crisis, such as the COVID-19 pandemic, including but not limited to potential delays in our clinical trials. The ultimate extent of the impact of any epidemic, pandemic or other public health crisis on our business, financial condition and results of operations will depend on future developments, which are highly uncertain and subject to change will depend on future developments, which cannot be accurately predicted, including the duration of the pandemic, additional or modified government actions, variants or new information that may emerge concerning the severity of such epidemic, pandemic or other public health, among others. Accordingly, we cannot predict the extent to which our business, financial condition and results of operations may be affected by the COVID-19 pandemic, but we are monitoring the situation closely.

LIQUIDITY AND GOING CONCERN

As of March 31, 2022, we had cash, cash equivalents and investments of $109.0 million and net working capital of $99.7 million. We have incurred cumulative net losses of $387.2 million since our inception and require capital to continue future development activities. We do not have any products approved for sale and have not generated any revenue from product sales. We have financed our operations primarily through the public offering and private placement of our equity, debt financing, funding from collaborations and patent assignments, asset sales and other arrangements. We expect our expenses to increase in connection with our ongoing activities, particularly as we conduct our Phase 3 program of CTP-543 in alopecia areata and seek marketing approval for CTP-543. For information regarding our recently completed equity financings, see Notes 12 and 13 in the consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

We are 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 our pipeline, the need to obtain marketing approval for our product candidates, the need to successfully commercialize and gain market acceptance of our 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.

Under ASC Topic 205-40, *Presentation of Financial Statements - Going Concern*, management is required at each reporting period to evaluate whether there are conditions and events, considered in the aggregate, that raise substantial doubt about an entity's ability to continue as a going concern within one year after the date that the financial statements are issued. This evaluation initially does not take into consideration the potential mitigating effect of management's plans that have not been fully implemented as of the date the financial statements are issued. When substantial doubt exists, management evaluates whether the mitigating effect of our plans sufficiently alleviates the substantial doubt about our ability to continue as a going concern. The mitigating effect of management's plans, however, is only considered if both (i) it is probable that the plans will be effectively implemented within one year after the date that the financial statements are issued and (ii) it is probable that the plans, when implemented, will mitigate the relevant conditions or events that raise substantial doubt about our ability to continue as a going concern within one year after the date that the financial statements are issued. Generally, to be considered probable of being effectively implemented, the plans must have been approved by the board of directors before the date that the financial statements are issued.

Successful completion of our development programs and, ultimately, the attainment of profitable operations are dependent upon future events, including obtaining adequate financing to support our cost structure and operating plan. Our plans to alleviate our financing requirements include, among other things, pursuing one or more of the following steps to raise additional capital, none of which can be guaranteed or are entirely within our control:

- raise funding through the sale of our common or preferred stock;
- raise funding through debt financing; and
- establish collaborations with potential partners to advance our product pipeline.

Based on our current operating plan, we believe that our current cash, cash equivalents and investments will allow us to meet our liquidity requirements into the fourth quarter of 2022. Our history of significant losses, our negative cash flows from operations, our limited liquidity resources currently on hand and our dependence on our ability to obtain additional financing to fund our operations after the current resources are exhausted, about which there can be no certainty, have resulted in our assessment that there is substantial doubt about our ability to continue as a going concern for a period of at least twelve months from the issuance date of this Quarterly Report on Form 10-Q. The accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business, and do not include any adjustments that may result from the outcome of this uncertainty.

If we are unable to raise capital when needed or on acceptable terms, or if we are unable to procure collaboration arrangements to advance our programs, we would be forced to discontinue some of our operations or develop and implement a plan to further extend payables, reduce overhead or scale back our current operating plan until sufficient additional capital is raised to support further operations. There can be no assurance that such a plan would be successful.

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 core capabilities in deuterium chemistry, identify potential product candidates, undertake nonclinical studies and clinical trials, manufacture clinical trial material in compliance with current good manufacturing practices, or cGMPs, provide general and administrative support for these operations and establish our intellectual property. We have generated an accumulated deficit of $387.2 million since inception through March 31, 2022 and will require substantial additional capital to fund our research and development activities. We do not have any products approved for sale and have not generated any revenue from product sales. We have financed our operations to date primarily through the public offering and private placement of our equity, debt financing, funding from collaborations and patent assignments, asset sales 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, conduct additional nonclinical studies and clinical trials and seek marketing approval for our product candidates.

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

Revenue

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

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 on 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 payments for the sale of assets. However, we have not yet earned any license exercise or option fees, sales-based milestone payments or royalty revenue as a result of product sales.

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

Research and development expenses

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

- employee-related expenses, including salary, benefits, travel and stock-based compensation expense;

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

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

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

The successful development of any of our product candidates is highly uncertain. As such, at this time, we cannot reasonably predict with certainty the duration and completion costs of the current or future clinical trials of any of our product candidates or if, when or to what extent we will generate revenues from the commercialization and sale of any of our product candidates that obtain marketing approval. We may never succeed in achieving marketing 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;
- successful enrollment in and completion of clinical trials, including on account of the COVID-19 pandemic and its impact on clinical trial sites;
- conduct of and results from ongoing as well as any additional clinical trials and research and development activities;
- significant and changing government regulation;
- the terms and timing and receipt of any marketing 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 cost 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 development programs and plans.

General and administrative expenses

General and administrative expenses consist primarily of salaries and related costs for personnel, including stock-based compensation and travel expenses for our employees in executive, operational, finance, legal, investor relations, 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 both 2022 and 2021, we incurred expenses for intellectual property matters related to CTP-543.

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 that a marketing approval of the first product candidate that we intend to commercialize on our own appears likely, we anticipate an increase in payroll and related expenses as a result of our preparation for commercial operations, especially as it relates to the sales, marketing and distribution of our product candidates.

Investment income

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

Unrealized (loss) gain on marketable equity securities

Unrealized (loss) gain on marketable equity securities consists of changes in the fair value of shares of common stock of Processa Pharmaceuticals, Inc., or Processa, held by us.

Unrealized loss on warrant liabilities

Unrealized loss on warrant liabilities consists of changes in the fair value of warrant liabilities resulting from the 2021 Financing, as discussed further in Note 13 in the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

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 March 31, 2022, we forecast an ordinary pre-tax loss for the year ended December 31, 2022 and, since we maintain a full valuation allowance on our deferred tax assets, we did not record an income tax benefit for the three months ended March 31, 2022.

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.

There have been 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, 2021 filed with the SEC on March 3, 2022.

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 condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

RESULTS OF OPERATIONS

Discussion of the three months ended March 31, 2022

The following table summarizes our results of operations for the three months ended March 31, 2022.

(Amounts in thousands)	Three Months Ended March 31, 2022
Operating expenses:	
Research and development	30,489
General and administrative	5,539
Total operating expenses	36,028
Loss from operations	(36,028)
Investment income	20
Unrealized loss on marketable equity securities	(564)
Unrealized loss on warrant liabilities	(1,156)
Net loss	$ (37,728)

Research and development expenses

The following table summarizes our research and development expenses for the three months ended March 31, 2022, with our external research expenses separately classified by program and our internal research expenses separately classified by category.

(Amounts in thousands)	Three Months Ended March 31, 2022
CTP-543 external expenses	$ 24,464
External expenses for other programs	82
Employee and contractor-related expenses	4,641
Facility and other expenses	1,302
Total research and development expenses	$ 30,489

Research and development expenses were $30.5 million for the three months ended March 31, 2022. CTP-543 external expenses primarily related to clinical development, including our Phase 3 clinical program. CTP-543 external expenses increased by $15.5 million for the three months ended March 31, 2022 compared to the three months ended March 31, 2021 primarily due to our ongoing Phase 3 clinical trials and open label, long-term extension studies. External expenses for other programs consisted of costs incurred to develop our research pipeline. Employee and contractor-related expenses for the three months ended March 31, 2022 decreased by $1.3 million compared to the three months ended March 31, 2021 primarily due to decreases in cash compensation and non-cash stock-based compensation expenses. Facility and other expenses consisted primarily of rent and maintenance of the Premises.

General and administrative expenses

The following table summarizes our general and administrative expenses for the three months ended March 31, 2022.

(Amounts in thousands)	Three Months Ended March 31, 2022
Employee salaries and benefits	$ 2,658
External professional service expenses	1,657
Facility, technology and other expenses	1,152
Depreciation and amortization	72
Total general and administrative expenses	$ 5,539

General and administrative expenses were $5.5 million for the three months ended March 31, 2022 and 2021.

Investment income

Investment income was $20 thousand for the three months ended March 31, 2022 and consisted of interest income earned on cash equivalents and investments.

Unrealized loss on marketable equity securities

Unrealized loss on marketable equity securities was $0.6 million for the three months ended March 31, 2022. The unrealized loss on marketable equity securities consisted of changes in the fair value of shares of common stock of Processa held by us.

Unrealized loss on warrant liabilities

Unrealized loss on warrant liabilities was $1.2 million for the three months ended March 31, 2022. The unrealized loss on warrant liabilities consisted of changes in the fair value of warrant liabilities related to the 2021 Financing, as discussed further in Note 13 in the condensed consolidated financial statements appearing elsewhere in this Quarterly Report on Form 10-Q.

Discussion of the three months ended March 31, 2021

The following table summarizes our results of operations for the three months ended March 31, 2021.

(Amounts in thousands)	Three Months Ended March 31, 2021
Revenue:	
License and research and development revenue	$ 5
Operating expenses:	
Research and development	18,500
General and administrative	5,485
Total operating expenses	23,985
Loss from operations	(23,980)
Investment income	25
Unrealized gain on marketable equity securities	1,286
Net loss	$ (22,669)

License and research and development revenue

Total revenue was $5 thousand for the three months ended March 31, 2021. The revenue recognized for the three months ended March 31, 2021 was from intellectual property cost reimbursements.

Research and development expenses

The following table summarizes our research and development expenses for the three months ended March 31, 2021, with our external research expenses separately classified by program and our internal research expenses separately classified by category.

(Amounts in thousands)	Three Months Ended March 31, 2021
CTP-543 external expenses	$ 9,015
CTP-692 external expenses	1,902
External expenses for other programs	290
Employee and contractor-related expenses	5,894
Facility and other expenses	1,399
Total research and development expenses	$ 18,500

Research and development expenses were $18.5 million for the three months ended March 31, 2021. CTP-543 external expenses primarily related to clinical development, including multiple Phase 2 clinical trials. CTP-692 external expenses were primarily attributable to the Phase 2 clinical trial, although development activities related to CTP-692 were discontinued following such trial failing to meet the primary or other secondary endpoints. External expenses for other programs consisted of costs incurred to develop our research pipeline. Employee and contractor-related expenses consisted primarily of cash compensation and non-cash stock-based compensation expenses. Facility and other expenses consisted primarily of rent and maintenance of the Premises.

General and administrative expenses

The following table summarizes our general and administrative expenses for the three months ended March 31, 2021.

(Amounts in thousands)	Three Months Ended March 31, 2021
Employee salaries and benefits	$ 3,104
External professional service expenses	1,310
Facility, technology and other expenses	995
Depreciation and amortization	76
Total general and administrative expenses	$ 5,485

Investment income

Investment income was $25 thousand for the three months ended March 31, 2021 and consisted of interest income earned on cash equivalents and investments.

Unrealized gain on marketable equity securities

Unrealized gain on marketable equity securities was $1.3 million for the three months ended March 31, 2021 and consisted of changes in the fair value of shares of common stock of Processa held by us.

LIQUIDITY AND CAPITAL RESOURCES

We have incurred cumulative losses and negative cash flows from operations since our inception in April 2006, and as of March 31, 2022, we had an accumulated deficit of $387.2 million. We anticipate that we will continue to incur losses for at least the next several years. We expect our expenses to increase in connection with our ongoing activities, particularly as we conduct our Phase 3 program of CTP-543 in alopecia areata and seek marketing approval for CTP-543. As a result, we will need additional capital to fund our operations, which we may raise through a combination of equity offerings, debt financings, collaboration and licensing arrangements and other sources.

As of March 31, 2022, we had cash, cash equivalents and investments of $109.0 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.

We have financed our operations to date primarily through the public offering and private placement of our equity, debt financing, funding from collaborations and patent assignments, asset sales and other arrangements. In February 2014, we completed our initial public offering 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. In 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 January 2020, we sold 5,735,283 shares of common stock through an underwritten public offering at a price to the public of $9.92 per share. At the same time, we sold to a certain existing investor pre-funded warrants to purchase up to an aggregate of 1,800,000 shares of common stock at a purchase price of $9.919 per pre-funded warrant, which represents the per share public offering price for the common stock less the $0.001 per share exercise price for each pre-funded warrant. The aggregate net proceeds from the January 2020 financing was $70.1 million.

In July 2017, we completed the transaction contemplated by the Vertex Agreement. We received $160.0 million in cash upon closing, with $16.0 million initially held in escrow, which was released to us in February 2019. In May 2021, we entered into the Vertex Amendment and received an additional $32.0 million in cash.

In March 2019, we entered into the ATM Agreement with Jefferies. As of March 31, 2022, we had sold 2,209,687 shares of our common stock pursuant to the ATM Agreement for aggregate net proceeds of $25.2 million, after payment of cash commissions of 3.0% of the gross proceeds to Jefferies.

In November 2021, we closed the 2021 Financing, raising $64.4 million in aggregate net proceeds. The 2021 Financing consisted of the sale of (i) 2,253,000 shares of common stock, (ii) 13,997 shares of Series X1 Preferred Stock, (iii) warrants to purchase up to 16,250 shares of Series X1 Preferred Stock and (iv) a portion of our right to receive potential future AVP-786 royalties under the Avanir Agreement. If the warrants issued in connection with the 2021 Financing are exercised in full, we would receive additional gross proceeds of $103.1 million.

Management does not believe that our cash, cash equivalents and investments of $109.0 million as of March 31, 2022 are sufficient to fund our current operating plan for at least twelve months after the issuance of this Quarterly Report on Form 10-Q. Based on our current operating plan, we anticipate having sufficient capital to fund our operations into the fourth quarter of 2022. Our history of significant losses, negative cash flows from operations, limited liquidity resources currently on hand and dependence on our ability to obtain additional financing to fund our operations after the current capital resources are exhausted, about which there can be no certainty, raises substantial doubt about our ability to continue as a going concern. The interim consolidated financial statements included elsewhere in this Quarterly Report on Form 10-Q were prepared under the assumption that we will continue as a going concern and do not include any adjustments relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might result from the outcome of this uncertainty.

Cash flows

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

(Amounts in thousands)	Three Months Ended March 31, 2022	2021
Net cash (used in) provided by:		
Operating activities	$ (32,324)	$ (20,714)
Investing activities	(49,949)	30,620
Financing activities	—	2,664
Net (decrease) increase in cash, cash equivalents and restricted cash	$ (82,273)	$ 12,570

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. During the three months ended March 31, 2022, our operating activities used cash of $32.3 million as compared to cash used by operating activities of $20.7 million during the three months ended March 31, 2021. Cash used in operating activities during both the three months ended March 31, 2022 and 2021 was primarily driven by our development activities associated with CTP-543.

Investing activities. Net cash used in or provided by investing activities consisted of purchases of investments, proceeds from the maturity of investments and purchases of fixed assets. Net cash used in purchases of investments for the three months ended March 31, 2022 was $49.9 million. There were no purchases of investments for the three months ended March 31, 2021. There were no maturities of investments for the three months ended March 31, 2022. Net cash provided by maturities of investments for the three months ended March 31, 2021 was $30.7 million. Purchases of fixed assets for each of the three months ended March 31, 2022 and 2021 were $0.1 million.

Financing activities. Financing activities did not provide or use cash for the three months ended March 31, 2022. Financing activities provided cash of $2.7 million for the three months ended March 31, 2021. The cash provided by financing activities during the three months ended March 31, 2021 was attributable to the $2.6 million in proceeds from our at-the-market offering program and $0.1 million in proceeds from the exercise of stock options.

Operating capital requirements

We do not anticipate commercializing any of our product candidates until 2024 at the earliest. 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. 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.

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.

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, collaboration and licensing arrangements and other sources. 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 or on favorable terms, 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 equity or debt securities, it could result in dilution to our existing stockholders, increased fixed payment obligations and the issuance of securities with 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.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

We are a smaller reporting company as defined by Rule 12b-2 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and are not required to provide the information required by this Item.

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 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 SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of March 31, 2022, the end of the period covered by this Quarterly Report on Form 10-Q. Based upon such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of such date.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the three months ended March 31, 2022 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 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 the COVID-19 Pandemic

Our business may be adversely affected by the ongoing COVID-19 pandemic.

Our business could be adversely affected by public health emergencies, health epidemics or pandemics in regions where we have concentrations of clinical trial sites or other business activities and could cause significant disruption in the operations of clinical research organizations and contract manufacturers upon whom we rely. For example, the COVID-19 pandemic continues to affect most regions of the world to varying degrees.

As a result of the COVID-19 pandemic, we may experience disruptions that could severely impact our business, clinical trials and supply chain, including:

- We believe that the COVID-19 pandemic has had, and may continue to have, an impact on our clinical trials, including our Phase 3 clinical trials and open label, long-term extension studies of CTP-543 for alopecia areata. Due to changes to study site operations and local travel restrictions, in some cases, these impacts include the potential need for remote assessments and delivery of study medication directly to patients. Some patients may choose to withdraw from our studies or we may choose to, or be required to, pause enrollment or patient dosing in order to preserve health resources and protect trial participants. As a result, the timelines to complete our clinical trials may be delayed.

- We believe that the COVID-19 pandemic may also have an impact on the clinical trials of our collaborators. For instance, AVP-786 is being developed under a collaboration with Avanir. Screening and enrollment in ongoing AVP-786 clinical trials were temporarily paused in 2020 due to restrictions associated with the COVID-19 pandemic, but have since resumed. However, even though screening and enrollment have resumed, we believe that the COVID-19 pandemic may continue to have an impact on these clinical trials. As a result, our collaborators' timelines to complete clinical trials may be delayed.

- We currently rely on third parties to, among other things, manufacture raw materials, manufacture our product candidates for our clinical trials, ship our product candidates to study sites, perform quality testing and supply other goods and services to run our business. If any such third party in our supply chain is adversely impacted by restrictions resulting, directly or indirectly, from the COVID-19 pandemic, including staffing shortages, production slowdowns or disruptions in delivery systems, our supply chain may be disrupted, limiting our ability to manufacture our product candidates for our clinical trials and conduct our research and development operations.

- Health regulatory agencies globally have experienced disruptions in their operations as a result of the COVID-19 pandemic. The FDA and comparable foreign regulatory agencies may have had slower response times or been under resourced, and travel restrictions are impacting the ability of the FDA and other agencies to conduct domestic and international facility inspections.

- Since March 2020, when foreign and domestic inspections of facilities were largely placed on hold, the FDA has been working to resume routine surveillance, bioresearch monitoring and pre-approval inspections on a prioritized basis. Since April 2021, the FDA has conducted limited inspections and employed remote interactive evaluations, using risk management methods, to meet user fee commitments and goal dates. In February 2022, the FDA resumed domestic inspections; however, travel restrictions and other uncertainties may impact or continue to impact oversight operations both domestic and abroad. The FDA is continuing to complete mission-critical work, prioritize other higher-tiered inspectional needs (e.g., for-cause inspections) and carry out surveillance inspections using risk-based approaches for evaluating public health. Should the FDA determine that an inspection is necessary for approval and an inspection cannot be completed during the review cycle due to restrictions on travel, and the FDA does not determine a remote interactive evaluation to be adequate, the FDA has stated that it generally intends to issue, depending on the circumstances, a complete response letter or defer action on the application until an inspection can be completed.

During the COVID-19 pandemic, a number of companies announced receipt of complete response letters due to the FDA's inability to complete required inspections for their applications. Regulatory authorities outside the United States may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic and may experience delays in their regulatory activities. Additionally, as of May 26, 2021, the FDA noted that it is continuing to ensure timely reviews of applications for medical products during the COVID-19 pandemic in line with its user fee performance goals and conducting mission critical domestic and foreign inspections to ensure compliance of manufacturing facilities with FDA quality standards. However, the FDA may not be able to continue its current pace, and approval timelines could be extended, including where a pre-approval inspection or an inspection of clinical sites is required and, due to the COVID-19 pandemic and travel restrictions, the FDA is unable to complete such required inspections during the review period. Any elongation or de-prioritization of our clinical trials or delay in regulatory review resulting from such disruptions could materially affect the development of our product candidates.

The COVID-19 pandemic continues to evolve. The ultimate impact of the COVID-19 pandemic on our business operations is highly uncertain and subject to change and will depend on future developments, which cannot be accurately predicted, including the duration of the pandemic, additional or modified government actions, new information and the actions taken to contain or address its impact in the short and long term, among others. We do not yet know the full extent of potential delays or impacts on our business, our clinical trials, healthcare systems or the global economy. We will continue to monitor the situation closely.

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 March 31, 2022, we had an accumulated deficit of $387.2 million. We have not generated any revenues from product sales and have financed our operations to date primarily through the public offering and private placement of our equity, debt financing, funding from collaborations and patent assignments, asset sales and other arrangements. We have not completed development of any product candidate and have devoted substantially all of our financial resources and efforts to research and development. 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;
- incur delays to the initiation or completion of our clinical trials due to the COVID-19 pandemic;
- incur any disruptions or delays to the supply of our product candidates due to the COVID-19 pandemic;
- 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. Doing so 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.

Based on our current operating plan, there is substantial doubt regarding our ability to continue as a going concern.

Based on our current operating plan, we believe that our cash, cash equivalents and investments as of March 31, 2022 will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2022. However, without significant changes to our current operating plan or raising additional capital, there is substantial doubt regarding our ability to continue as a going concern for a period of at least twelve months from the issuance date of this Quarterly Report on Form 10-Q.

We will need substantial additional funding. If we are unable to raise capital when needed or on favorable terms, we could be forced to delay, reduce or eliminate our 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 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 acceptable 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, 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 in the future through a combination of equity offerings, debt financings, collaboration and licensing arrangements and other sources. Adequate additional financing may not be available to us on acceptable terms, or at all. Market volatility, increasing inflation and rising interest rates resulting from various factors could also adversely impact our ability to access capital as and when needed. Our failure to raise capital when needed would have a negative impact on our financial condition and our ability to pursue our business strategy.

Based on our current operating plan, we believe that our cash, cash equivalents and investments as of March 31, 2022 will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2022. Our estimate as to how long we expect our cash, 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, including on account of the COVID-19 pandemic and its impact on our clinical trial sites;
- 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 marketing 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;
- potential litigation costs; 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 equity offerings, debt financings, collaboration and licensing arrangements and other sources. We do not have any committed external source of funds, other than potential milestone payments and royalties under our existing license agreements, 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. For example, in November 2021, we issued to the Investors (i) 13,997 shares of Series X1 Preferred Stock, (ii) 2,253,000 shares of common stock, (iii) warrants to purchase up to 16,250 shares of Series X1 Preferred Stock and (iv) a portion of our right to receive potential future AVP-786 royalties under the Avanir Agreement. 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.

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 are conducting our first international, multi-center, pivotal clinical program and have not yet demonstrated an ability to successfully 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.

Risks Related to the Development 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 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.

For example, in February 2021, we announced that our Phase 2 clinical trial to evaluate CTP-692 as an adjunctive treatment for schizophrenia did not meet the primary endpoint or other secondary endpoints. As a result, we have ceased development of CTP-692.

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 treat moderate to severe alopecia areata with acceptable safety and efficacy;
- successful and timely completion of clinical trials, including the impact of the COVID-19 pandemic on the initiation or completion of our clinical trials and the supply of our product candidates;
- 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 (i) 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, (ii) we, or our collaborators, are unable to successfully complete clinical trials of our product candidates or other testing, (iii) the results of these trials or tests are unfavorable, uncertain or are only modestly favorable or (iv) 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.

For instance, AVP-786 is being developed under a collaboration with Avanir. In 2019, Avanir completed two Phase 3 clinical trials evaluating AVP-786 for the treatment of agitation associated with dementia of the Alzheimer's type. The second of the Phase 3 clinical trials did not meet its primary or key secondary endpoints; however, following additional data analysis, Avanir decided to continue developing AVP-786 for the treatment of agitation associated with dementia of the Alzheimer's type in a number of ongoing Phase 3 clinical trials. Additionally, Avanir is conducting a Phase 2/3 clinical trial evaluating AVP-786 for the treatment of negative symptoms of schizophrenia. However, given the results of Avanir's second Phase 3 clinical trial of AVP-786 for the treatment of agitation associated with dementia of the Alzheimer's type, there is no guarantee that any future trials of AVP-786 will meet their primary or key secondary endpoints.

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;
- unexpectedly high placebo response rates;
- rater variability in the assessment of clinical endpoints;
- 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 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;
- criminal or unauthorized misuse of computer systems may result in disruption to our, or our partners' or vendors', clinical trials, nonclinical activities or manufacturing, or may compromise data from our, or our partners' or vendors', clinical or nonclinical studies;
- regulators or institutional review boards, or IRBs, 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, IRBs 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 COVID-19 pandemic may impact the FDA's or comparable foreign regulatory authorities' ability to continue its normal operations;
- 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, including as a result of shipping delays or vendor personnel shortages due to the COVID-19 pandemic;
- 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.

Additionally, timely enrollment, conduct, progress and completion of clinical trials are reliant on clinical trial sites, which may be adversely affected by global health matters, including, among other things pandemics. For example, some of our clinical trial sites have been impacted by the COVID-19 pandemic. As the COVID-19 pandemic continues to evolve, the conduct of our clinical trials may be adversely affected, despite efforts to mitigate this impact.

If we, or our collaborators, experience delays or difficulties in the enrollment of patients in clinical trials, our, or their, receipt of necessary marketing 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 availability or interest of clinical sites to enroll patients into our trials;
- the willingness or availability of patients to participate in our clinical trials, including due to the COVID-19 pandemic;
- 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 therapy in connection with the trial;
- the potential need to discontinue investigational treatment at the completion of the study;
- the availability of other effective treatments for the indication we are assessing;
- 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 or used for the indications we are investigating.

For instance, we, and our collaborators, are conducting clinical trials in Eastern European countries that may be affected by the ongoing conflict in Ukraine. In particular, some clinical trial sites for Avanir's clinical trials evaluating AVP-786 are located in Ukraine, and it is unknown whether the timeline to complete such clinical trials will be delayed as a result of the ongoing conflict.

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.

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 IRB, 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.

Breakthrough Therapy and Fast Track designations by the FDA may not lead to faster development, regulatory review or approval.

Although the FDA has granted CTP-543 Breakthrough Therapy designation for the treatment of adult patients with moderate to severe alopecia areata and Fast Track designation for the treatment of alopecia areata, Breakthrough Therapy and Fast Track designations do not necessarily lead to a faster development pathway or regulatory review process and do not increase the likelihood of marketing approval. The FDA may later withdraw the designations if it believes that CTP-543 no longer meets the necessary conditions.

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

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.

Risks Related to Our Dependence on Third Parties

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 third parties, 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 and regulatory requirements 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 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 IRBs. 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.

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 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;
- collaborators may conduct their clinical trials poorly or inadequately, harming our products, including our products' development in other territories;
- 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 steal our trade secrets or may hire valuable employees from us;
- collaborators may fail to protect our trade secrets;
- 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.

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 substantially limit our ability to seek and obtain patent protection for new product candidates based on deuterium modification of compounds. It may also limit our ability to develop new product candidates based on deuterium modification of such compounds without obtaining a license from those patent holders. In certain cases, a company that owns the patent on a non-deuterated compound may be able to file a continuation or divisional patent on deuterated analogs of their compounds that successfully claims priority to the original filing date of the non-deuterated composition, causing their patent to have priority over ours, even if filed later than ours was.

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, or PGR, inter partes review, or IPR, or interference proceedings in the United States or elsewhere, challenging our patent rights or the patent rights of others. For example, in April 2018, the Patent Trial and Appeal Board, or PTAB, instituted an IPR brought against our U.S. Patent No. 9,249,149, or the '149 patent, by Incyte Corporation, or Incyte. The '149 patent covers the composition of matter of deuterated analogs of ruxolitinib, including CTP-543. In April 2019, the PTAB issued a final written decision in connection with the IPR that held that the claims of the '149 patent were unpatentable as obvious. We are in the process of appealing the final written decision to the U.S. Court of Appeals for the Federal Circuit. The '149 patent remains valid and enforceable until any appeals by us have been exhausted.

In addition, in May 2021, the PTAB instituted a PGR brought against our U.S. Patent No. 10,561,659, or the '659 patent, by Incyte. The '659 patent covers methods of treating hair loss, including alopecia areata, with certain doses of CTP-543. We expect the PTAB to issue a final written decision in connection with the PGR by May 2022.

We intend to vigorously defend the '149 and '659 patents; however, there can be no assurance that we will be successful in defending them. If both patents are found to be invalid, it could potentially shorten the timeframe during which we could prevent generic versions of CTP-543 from entering the market. In addition, adverse determinations in any other 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 that 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 U.S. 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 abbreviated new drug applications, or 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 Patent and Trademark Office's PGR proceedings. 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.

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 deuterated analog of ruxolitinib. Incyte owns patents covering ruxolitinib that may be unexpired if and when we seek marketing approval for CTP-543. Incyte also owns a U.S. patent that broadly claims deuterated analogs of ruxolitinib. In June 2017, we filed a PGR with the PTAB seeking to invalidate all claims of Incyte's U.S. patent that covers deuterated analogs of ruxolitinib. In January 2018, the PTAB did not grant our petition to challenge the validity of Incyte's patent. In May 2018, our request for reconsideration was denied.

In addition, Columbia University is the assignee of patents licensed to Aclaris Therapeutics, Inc. claiming the use of ruxolitinib, isotopic forms of ruxolitinib and other named JAK inhibitors for the treatment of hair loss disorders, including alopecia areata, which may be unexpired if and when we seek marketing approval for 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 with respect to our product candidates. 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.

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.

In seeking to develop and maintain a competitive position through our knowledge of deuterium chemistry 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.

Risks Related to the Manufacturing of Our Product Candidates

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, or that the product candidates will not be of sufficient quality or reproducibility or produced on our desired schedule, 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;
- potentially incorrect data analysis, resulting in falsely-positive, falsely-negative or misleading or uninterpretable results;
- potential industrial accidents such as fires or explosions that compromise our product candidates or the ability of the contractors to timely deliver them;
- natural disasters, public health crises, pandemics and epidemics, including the COVID-19 pandemic;
- the possible termination or non-renewal 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 non-conformance 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.

In some cases, the technical skills required to manufacture our product candidates may be unique or proprietary to the original manufacturer and we may have difficulty, or there may be contractual restrictions prohibiting us from, transferring such skills to a back-up or alternate supplier, or we may be unable to transfer such skills at all. In addition, if we are required to change manufacturers for any reason, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations. We will also need to verify, such as through a manufacturing comparability study, that any new manufacturing process will produce our product candidates according to the specifications previously submitted to the FDA or another regulatory authority. The delays associated with the verification of a new manufacturer could negatively affect our ability to develop product candidates or commercialize our products in a timely manner or within budget. Furthermore, a manufacturer may own the intellectual property rights to technology related to the manufacture of our product candidates. This would increase our reliance on such manufacturer or require us to obtain a license from such manufacturer in order to have another party manufacture our product candidates. In addition, changes in manufacturers often involve changes in manufacturing procedures and processes, which could require that we conduct bridging studies between our prior clinical supply used in our clinical trials and that of any new manufacturer. We may be unsuccessful in demonstrating the comparability of clinical supplies, which could require the conduct of additional clinical trials.

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 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 inspected 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, or if they unacceptably deviate from standard operating procedures in the production of our product candidates, they will not be able to secure the applicable approval for or a regulatory authority may find deficiencies with their manufacturing facilities. If deficiencies are found at these facilities or 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.

Because there are limited commercial suppliers of deuterated materials and the import/export of deuterated materials may be controlled by governments, we, and our collaborators, are exposed to a number of risks and uncertainties associated with our supply of deuterated materials.

When manufacturing our product candidates, we incorporate deuterium using either deuterium oxide or deuterated chemical reagents (which themselves are derived from deuterium oxide). As a result, we rely on being able to obtain and transport deuterated materials in order to manufacture our product candidates.

We rely on third parties to both supply deuterated materials and to manufacture our product candidates. However, our suppliers of deuterated materials are often located in different countries than the manufacturers of our product candidates, which would require the deuterated materials to be transported across country borders.

Transporting deuterated materials across country borders often requires licenses or other government approvals. The import and export of deuterated materials into or out of the United States is regulated and may require a license from the Nuclear Regulatory Commission or other government agency. Similarly, the import and export of deuterated materials into or out of other countries may require local government license or approvals. Licenses and certain other required documents may specify the maximum amount of deuterated materials that we, or our suppliers, are permitted to import or export per year. We, or our suppliers, may not be able to obtain such licenses or approvals in a timely manner or at all. In addition, our current import and export licenses may be insufficient to meet our future requirements.

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

If we are unable to obtain sufficient supplies of deuterated materials, our ability to produce our product candidates would be impeded and our business, financial condition and prospects could be harmed. Additionally, the inability to import or export deuterated materials to our third-party manufacturers could have a particularly severe impact on our ability to develop or commercialize our product candidates.

Similarly, to develop and commercialize any of our licensed product candidates, our collaborators will need to obtain supplies of deuterated materials and will be subject to risks and requirements in connection with sourcing deuterated materials that are similar to the ones that we face. Any adverse impact on our collaborators' ability to obtain deuterated materials could delay or prevent the development or commercialization of our licensed product candidates, which could have a material adverse effect on our business.

Risks Related to Marketing Approval of Our Product Candidates

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. Conversely, in certain countries regulators may consider our deuterated compounds to be equivalent to non-deuterated compounds that possess regulatory exclusivity and therefore refuse to approve our compounds until the expiration of that exclusivity.

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.

Even if we, or our collaborators, obtain marketing approvals for our product candidates, the approved labeling may include significant safety warnings or use limitations, which could adversely affect the degree of market acceptance.

When the FDA approves a product, it also approves the label that is required to accompany the product. In some cases, the label may contain significant safety warnings, including boxed warnings, commonly referred to as "black box" warnings. Boxed warnings may be required based on safety data related to the approved product itself or safety data from other products with similar mechanisms of action, even if the safety events identified in the boxed warnings have not been reported with the approved product.

The JAK inhibitors tofacitinib, baricitinib and upadacitinib were all approved for use in rheumatoid arthritis with similar boxed warnings. In September 2021, the FDA issued a Drug Safety Communication regarding the risks associated with JAK inhibitors used to treat certain chronic inflammatory conditions. In this communication, the FDA announced that the boxed warnings for tofacitinib would be expanded based on an increased risk of serious heart-related events seen in a large, randomized safety clinical trial with tofacitinib in patients with rheumatoid arthritis. The FDA also announced that the expansion of the boxed warnings would apply to the other two JAK inhibitors, baricitinib and upadacitinib, even though those approved products have not been studied in similar large, randomized safety clinical trials. In addition, the FDA has limited the use of some JAK inhibitors in certain indications to those patients who have not responded to or cannot tolerate other approved products that have a different mechanism of action. In September 2021, the FDA approved a topical formulation of the JAK inhibitor ruxolitinib for mild to moderate atopic dermatitis with a label that includes the same boxed warnings and specifies short term use when other topical agents have failed. In January 2022, the FDA approved JAK inhibitors upadacitinib and abrocitinib in moderate to severe atopic dermatitis not controlled by other systemic agents, or when their use is inadvisable, with the same boxed warnings.

CTP-543 is an oral JAK inhibitor that we are developing for the treatment of alopecia areata, for which there are currently no treatments approved by the FDA. If we are successful in obtaining marketing approval for CTP-543, it is unknown whether the FDA will impose similar boxed warnings on CTP-543. If other products are approved for the treatment of alopecia areata that are not JAK inhibitors, it is also unknown whether the FDA will limit the use of CTP-543 to those patients who have not responded to or cannot tolerate the other approved products.

If the FDA approves any of our product candidates and imposes boxed warnings or use limitations, the market acceptance could be adversely affected.

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 such price. 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 Federal Food, Drug, and Cosmetic Act, or 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 healthcare 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;
- reputational damage;
- 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.

Risks Related to Commercialization and Market Acceptance of Our Product Candidates

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 autoimmune disorders. Our competitors may succeed in developing, acquiring or licensing technologies and drug products that attain preferred reimbursement by payors or 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.

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. Other companies pursuing development of oral JAK inhibitors for the treatment of alopecia areata include Eli Lilly and Company and Pfizer Inc.

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.

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, 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, patients, 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;
- the pricing, extent of discounts or bundled products offered by our competitors;
- the organization stability of our collaborators, if any;
- 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
- the 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 or at a higher rate than was projected during clinical development, 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 need 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 boxed warnings 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 operate under a REMS;
- 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 as a company 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 that 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, if at all. 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, or may actively sell a competing product at the expense of selling ours.

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.

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 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 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 at least 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 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.

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

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

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 Healthcare Regulations

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 other jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could affect our future results of operations. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare. Individual states in the United States have also increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures and, in some cases, designed to encourage importation from other countries and bulk purchasing. See the section entitled "Healthcare Reform" contained in Part I, Item 1. of our Annual Report on Form 10-K for the fiscal year ended December 31, 2021 filed with the SEC on March 3, 2022.

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 U.S. 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.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the extent to which state and federal governments cover particular healthcare products and services and could limit the amounts that the federal and state governments will pay for healthcare products and services. This could result in reduced demand for any product candidate we develop or could result in additional pricing pressures.

In markets outside of the United States, reimbursement and healthcare payment systems vary significantly by country, and many countries have instituted price ceilings on specific products and therapies. The price control regulations outside of the United States can have a significant impact on the profitability of a given market, and further uncertainty is introduced if and when these laws change.

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. See the sections entitled "Healthcare Reform" and "Healthcare Law and Regulation" contained in Part I, Item 1. of our Annual Report on Form 10-K for the fiscal year ended December 31, 2021 filed with the SEC on March 3, 2022.

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 the federal Health Insurance Portability and Accountability Act of 1996, or 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.

Risks Related to Legal Compliance Matters

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, including any laws and regulations that may be imposed as a result of the COVID-19 pandemic. Current or future environmental laws and regulations may impair our research, development or production efforts, which could adversely affect our business, financial condition, results of operations or prospects. In addition, failure to comply with these laws and regulations may result in substantial fines, penalties or other sanctions.

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 product 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 product 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.

Risks Related to Data Protection and Cybersecurity

Our failure to comply with data protection laws and regulations could lead to government enforcement actions, private litigation and/or adverse publicity and could negatively affect our operating results and business.

We are subject to data protection laws and regulations that address privacy and data security. The legislative and regulatory landscape for data protection continues to evolve, and in recent years there has been an increasing focus on privacy and data security issues. In the United States, numerous federal and state laws and regulations, including state data breach notification laws, state health information privacy laws and federal and state consumer protection laws govern the collection, use, disclosure and protection of health-related and other personal information. Failure to comply with data protection laws and regulations could result in government enforcement actions, which could include civil or criminal penalties, private litigation and/or adverse publicity and could negatively affect our operating results and business. In addition, we may obtain health information from third parties that are subject to privacy and security requirements under HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act. We could be subject to criminal penalties if we knowingly obtain or disclose individually identifiable health information in a manner that is not authorized or permitted.

The collection and use of personal health data in the European Union is governed by the provisions of the General Data Protection Regulation, or the GDPR, which came into effect in May 2018. This regulation imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, notification of data processing obligations to the competent national data protection authorities and the security and confidentiality of the personal data. The GDPR also imposes strict rules on the transfer of personal data out of the European Union to the United States. Failure to comply with the requirements of the GDPR and the related national data protection laws of the European Union Member States may result in significant fines and other administrative penalties.

Significant disruptions of information technology systems or security breaches could adversely affect our business.

We are increasingly dependent upon information technology systems, infrastructure and data to operate our business. In the ordinary course of business, we collect, store and transmit large amounts of confidential information (including, among other things, trade secrets or other intellectual property, proprietary business information and personal information). It is critical that we do so in a secure manner to maintain the confidentiality and integrity of such confidential information. We also have outsourced elements of our operations to third parties, and as a result we manage a number of third-party vendors who may or could have access to our confidential information. The size and complexity of our information technology systems, and those of third-party vendors with whom we contract, and the large amounts of confidential information stored on those systems, make such systems vulnerable to service interruptions or to security breaches from inadvertent or intentional actions by our employees, consultants, third-party vendors, and/or business partners, or from cyber-attacks by malicious third parties. Cyber-attacks are increasing in their frequency, sophistication and intensity, and have become increasingly difficult to detect. Cyber-attacks could include the deployment of harmful malware, ransomware, denial-of-service attacks, social engineering and other means to affect service reliability and threaten the confidentiality, integrity and availability of information. Cyber-attacks could also include phishing attempts or e-mail fraud to cause payments or information to be transmitted to an unintended recipient.

Significant disruptions of our information technology systems, or those of our third-party vendors, or security breaches could adversely affect our business operations and/or result in the loss, misappropriation and/or unauthorized access, use or disclosure of, or the prevention of access to, confidential information, including, among other things, trade secrets or other intellectual property, proprietary business information and personal information, and could result in financial, legal, business and reputational harm to us. For example, any such event that leads to unauthorized access, use or disclosure of personal information, including personal information regarding our patients or employees, could harm our reputation, require us to comply with federal and/or state breach notification laws and foreign law equivalents, and otherwise subject us to liability under laws and regulations that protect the privacy and security of personal information. Security breaches and other inappropriate access can be difficult to detect, and any delay in identifying them may lead to increased harm of the type described above. While we have implemented security measures to protect our information technology systems and infrastructure, there can be no assurance that such measures will prevent service interruptions or security breaches that could adversely affect our business.

Risks Related to Employee Matters and Managing Growth

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

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

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

entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to develop and commercialize product candidates will be limited.

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

As our pipeline grows and matures and we seek marketing approval for and commercialize our product candidates, we expect to experience significant growth in the number of our employees and the scope of our operations, including in the areas of clinical development, drug manufacturing, regulatory affairs, sales, marketing and distribution. Our management may need to divert a disproportionate amount of its attention away from our day-to-day activities to devote time to managing these growth activities. To manage these growth activities, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. Moreover, the expected expansion of our operations may lead to significant costs and may divert our business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

Risks Related to an Investment in Our Common Stock

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

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

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

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

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

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

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

We are a "smaller reporting company," and the reduced disclosure requirements applicable to smaller reporting companies may make our common stock less attractive to investors.

We are a smaller reporting company under applicable SEC regulations. For so long as we remain a smaller reporting company, we are permitted and plan to rely on exemptions from certain disclosure requirements applicable to other public companies, including reduced disclosure obligations regarding executive compensation. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

We will continue to incur significant expenses as a result of operating as a public company.

As a public company, we are incurring and expect to continue to incur significant legal, accounting and other expenses.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or SOX, we are required to evaluate the effectiveness of our internal control over financial reporting as of the end of each fiscal year and to report on this evaluation in our Annual Report on Form 10-K for the year. We will need to continue to dedicate internal resources, engage outside consultants and maintain a detailed work plan to assess and document the adequacy of our internal control over financial reporting, continue to improve control processes as appropriate, validate through testing that controls are functioning as documented and maintain a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that in the future we will not be able to conclude that our internal control over financial reporting is effective as required by SOX Section 404. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

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

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares of common stock intend to sell shares, could reduce the market price of our common stock.

In addition, as of May 2, 2022, there were:

- 6,322,256 shares of common stock subject to outstanding options and RSUs under our equity compensation plans, all of which are registered under the Securities Act of 1933, as amended, or the Securities Act. These shares of common stock will be able to be freely sold in the public market upon exercise, as permitted by any applicable vesting requirements, except to the extent they are held by our affiliates, in which case such shares will become eligible for sale in the public market as permitted by Rule 144 under the Securities Act;
- 12,621 shares of Series X1 Preferred Stock issued and outstanding, which are convertible into 12,621,000 shares of common stock. The Series X1 Preferred Stock is equivalent to common stock in all respects except that it is non-voting and is convertible into common stock at the holder's election, subject to beneficial ownership limitations. The shares of Series X1 Preferred Stock and the shares of common stock issuable upon conversion of the Series X1 Preferred Stock are registered under the Securities Act;

- outstanding warrants to purchase 16,250 shares of Series X1 Preferred Stock, which, upon exercise, are convertible into 16,250,000 shares of common stock; and
- outstanding warrants to purchase 1,861,273 shares of common stock, 1,800,000 shares of which are registered under the Securities Act. The remaining 61,273 shares will become eligible for sale in the public market, to the extent such warrant is exercised, as permitted by Rule 144 under the Securities Act.

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

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

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

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

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

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

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

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

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

Risks Related to Our Charter and By-Laws

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

Provisions in our corporate charter and our by-laws may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which our stockholders might otherwise receive a premium for their shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions:

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

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

Our by-laws designate specific courts as the exclusive forum for certain litigation that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us.

Pursuant to our by-laws, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for state law claims for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of or based on a fiduciary duty owed by any of our current or former directors, officers or other employees to us or our stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law or our charter or by-laws, (iv) any action to interpret, apply, enforce or determine the validity of our charter or by-laws or (v) any action asserting a claim governed by the internal affairs doctrine of the State of Delaware. In addition, pursuant to our by-laws, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States will be the sole and exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. These forum selection clauses in our by-laws may limit our stockholders' ability to obtain a favorable judicial forum for disputes with us.

Risks Related to Income Taxes

Changes in tax law could adversely affect our business and financial condition or holders of our common stock.

The rules dealing with U.S. federal, state and local income taxation are constantly under review by persons involved in the legislative process and by the Internal Revenue Service and Treasury Department. Changes to tax laws (which changes may have retroactive application) could adversely affect us or holders of our common stock. In recent years, many such changes have been made and changes are likely to continue to occur in the future. Future changes in tax laws could have a material adverse effect on our business, cash flow, financial condition or results of operations. We urge stockholders to consult with their legal and tax advisers regarding the implications of potential changes in tax laws on an investment in our common stock.

Item 6. Exhibits.

Exhibit number	Description
31.1*	Principal Executive Officer — Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Principal Financial Officer — Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1**	Principal Executive Officer — Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2**	Principal Financial Officer — Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS*	XBRL Instance Document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document
104*	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in Exhibits 101.*)

* Filed herewith.
** Furnished herewith.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

CONCERT PHARMACEUTICALS, INC.

Date: May 5, 2022

By: /s/ Marc A. Becker

Marc A. Becker
Chief Financial Officer
(Principal Financial Officer)

Exhibit 31.1

CERTIFICATION PURSUANT TO RULE 13a-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Roger D. Tung, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Concert Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 5, 2022

/s/ Roger D. Tung

Roger D. Tung
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO RULE 13a-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Marc A. Becker, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Concert Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 5, 2022

/s/ Marc A. Becker

Marc A. Becker
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Concert Pharmaceuticals, Inc. (the "Company") for the period ended March 31, 2022, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Roger D. Tung, President and Chief Executive Officer of the Company, hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: May 5, 2022

/s/ Roger D. Tung
Roger D. Tung
President and Chief Executive Officer
(Principal Executive Officer)

A signed original of this written statement required by Section 906 has been provided to Concert Pharmaceuticals, Inc. and will be retained by Concert Pharmaceuticals, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Concert Pharmaceuticals, Inc. (the "Company") for the period ended March 31, 2022, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Marc A. Becker, Chief Financial Officer of the Company, hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: May 5, 2022

/s/ Marc A. Becker
Marc A. Becker
Chief Financial Officer
(Principal Financial Officer)

A signed original of this written statement required by Section 906 has been provided to Concert Pharmaceuticals, Inc. and will be retained by Concert Pharmaceuticals, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.