UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-Q

(Mark One)

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

For the quarterly period ended March 31, 2019
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: 001-36694

PROTEON THERAPEUTICS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**20-4580525**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

200 West Street
Waltham, MA
(Address of principal executive offices)
02451
(Zip Code)
(781) 890-0102
(Registrant's telephone number, including area code)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes [X] 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 [X] 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 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 [X]
Emerging growth company [X]	

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

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

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, $0.001 Par Value per share	PRTO	Nasdaq Global Select Market

As of May 6, 2019 there were 19,585,394 shares of the registrant's common stock, par value $0.001 per share, outstanding.

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CAUTIONARY NOTE FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q contains forward-looking statements, which reflect our current views with respect to, among other things, our operations and financial performance. All statements other than statements of historical facts contained in this Quarterly Report on Form 10-Q are forward-looking statements. You can identify these forward-looking statements by the use of words such as "outlook," "believes," "expects," "potential," "continues," "may," "will," "should," "seeks," "approximately," "predicts," "intends," "plans," "estimates," "anticipates" or the negative version of these words or other comparable words. These forward-looking statements are subject to various risks and uncertainties. Accordingly, there are or will be important factors that could cause actual outcomes or results to differ materially from those indicated in these statements. These forward-looking statements include, but are not limited to, statements about:

- our evaluation of strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the company, the sale of the company's assets in one or more transactions to one or more third parties or a liquidation and dissolution of the company;
- our estimates regarding the amount of funds we require to fund our operations;
- our interpretation of the data from our completed Phase 2 and Phase 3 clinical trials for vonapanitase;
- our estimates regarding expenses, future revenues, capital requirements, the sufficiency of our current and expected cash resources and our need for additional financing and plans for additional financing;
- our estimates regarding general and administrative costs and salary and personnel costs and costs associated with being a public company;
- our intellectual property position;
- our plans to retain key personnel;
- future payment of dividends;
- the impact of accounting policies;
- the impact of changes in interest rates; and
- exposure to foreign currency exchange risks and our purchase of forward foreign currency contracts in the future.

All forward-looking statements in this Quarterly Report on Form 10-Q involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. Factors that may cause actual results to differ materially from current expectations include, among other things, the risk factors set forth below in Part II, Item 1A, Risk Factors, and elsewhere in this Quarterly Report on Form 10-Q. These factors should not be construed as exhaustive and should be read in conjunction with the other cautionary statements that are included in this Quarterly Report on Form 10-Q. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

This Quarterly Report on Form 10-Q also contains estimates, projections and other information concerning our industry, our business, and the markets for certain medical conditions, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market and other data from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data and similar sources.

PART I – FINANCIAL INFORMATION

Item 1. Financial Statements

Proteon Therapeutics, Inc.
Condensed Consolidated Balance Sheets
(in thousands, except share and per share data)
(Unaudited)

	March 31, 2019	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	$ 16,763	$ 19,371
Available-for-sale investments	-	2,496
Prepaid expenses and other current assets	1,035	1,369
Operating lease right-of-use asset	135	-
Total current assets	17,933	23,236
Property and equipment, net	105	263
Restricted cash	22	22
Total assets	$ 18,060	$ 23,521
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 1,676	$ 441
Accrued expenses	1,559	2,637
Operating lease liability	135	-
Total current liabilities	3,370	3,078
Total liabilities	3,370	3,078
Commitments and contingencies (Note 5)		
Stockholders' equity:		
Preferred stock, $0.001 par value per share; 10,000,000 shares authorized at March 31, 2019 and December 31, 2018:		
Series A convertible preferred stock 22,000 shares authorized at March 31, 2019 and December 31, 2018 authorized; 21,660 and 22,000 issued and outstanding at March 31, 2019 and at December 31, 2018 , respectively	21,183	21,523
Common stock, $0.001 par value, 100,000,000 shares authorized at March 31, 2019 and December 31, 2018; 19,585,394 and 19,243,651 shares issued and outstanding at March 31, 2019 and December 31, 2018, respectively	19	19
Additional paid-in capital	210,486	209,366
Accumulated deficit	(217,001)	(210,470)
Accumulated other comprehensive income	3	5
Total stockholders' equity	14,690	20,443
Total liabilities and stockholders' equity	$ 18,060	$ 23,521

The accompanying notes are an integral part of these unaudited condensed consolidated financial statements.

Proteon Therapeutics, Inc.
Condensed Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share data)
(Unaudited)

	Three Months Ended March 31,	
	2019	**2018**
Operating expenses:		
Research and development	$ 4,048	$ 4,071
General and administrative	2,589	2,294
Total operating expenses	6,637	6,365
Loss from operations	(6,637)	(6,365)
Other income :		
Investment income	105	92
Other income, net	1	192
Total other income	106	284
Net loss	$ (6,531)	$ (6,081)
Foreign currency translation adjustment	$ (2)	$ 2
Unrealized gain on available-for-sale investments	-	8
Comprehensive loss	$ (6,533)	$ (6,071)
Reconciliation of net loss to net loss attributable to common stockholders:		
Net loss	$ (6,531)	$ (6,081)
Net loss attributable to common stockholders	$ (6,531)	$ (6,081)
Net loss per share attributable to common stockholders - basic and diluted	$ (0.34)	$ (0.34)
Weighted-average common shares outstanding used in net loss per share attributable to common stockholders - basic and diluted	19,255,042	17,674,729
Supplemental disclosure of stock-based compensation expense:		
Included in operating expenses, above, are the following amounts for non-cash stock-based compensation expense:		
Research and development	$ 255	$ 267
General and administrative	525	554
Total	$ 780	$ 821

The accompanying notes are an integral part of these unaudited condensed consolidated financial statements.

Proteon Therapeutics, Inc.
Condensed Consolidated Statements of Stockholders' Equity
(in thousands, except share and per share data)
(Unaudited)

For the three Months Ended March 31, 2019

	Series A Convertible Preferred Stock		Common Stock				Accumulated Other	
	Shares	Amount	Shares	$0.001 Par Value	Additional Paid-in Capital	Accumulated Deficit	Comprehensive (Loss) Income	Total Stockholders' Equity
Balance at December 31, 2018	22,000	$ 21,523	19,243,651	$ 19	$ 209,366	$ (210,470)	$ 5	$ 20,443
Conversion of Series A convertible preferred stock into Common Stock	(340)	(340)	341,743	-	340	$ -	$ -	-
Stock-based compensation expense	-	-	-	-	780	-	-	780
Other comprehensive gain/(loss)	-	-	-	-	-	-	(2)	(2)
Net loss	-	-	-	-	-	(6,531)	-	(6,531)
Balance at March 31, 2019	21,660	$ 21,183	19,585,394	$ 19	$ 210,486	$ (217,001)	$ 3	$ 14,690

For the three Months Ended March 31, 2018

Balance at December 31, 2017	22,000	$ 21,523	17,674,729	$ 18	$ 202,953	$ (189,741)	$ (14)	$ 34,739
Exercise of common stock options	-	-	-	-	-	-	-	-
Issuance of common stock upon ESPP purchase	-	-	-	-	-	-		-
Issuance of common stock, net of issuance costs	-	-	-	-	-			-
Stock-based compensation expense	-	-	-	-	821	-		821
Other comprehensive gain/(loss)	-	-	-	-	-	-	10	10
Net loss	-	-	-	-		(6,081)	-	(6,081)
Balance at March 31, 2018	22,000	$ 21,523	17,674,729	$ 18	$ 203,774	$ (195,822)	$ (4)	$ 29,489

The accompanying notes are an integral part of these unaudited condensed consolidated financial statement

Proteon Therapeutics, Inc.
Condensed Consolidated Statements of Cash Flows
(in thousands)
(Unaudited)

	Three Months Ended March 31,	
	2019	**2018**
Operating activities		
Net loss	$ (6,531)	$ (6,081)
Reconciliation of net loss to net cash used in operating activities:		
Depreciation	174	32
Amortization of premium/discount on available-for-sale securities	(4)	3
Foreign currency remeasurement loss	-	(136)
Stock-based compensation	780	821
Changes in:		
Prepaid expenses and other assets	349	121
Operating lease right-of-use asset	65	-
Interest receivable	(15)	4
Accounts payable and accrued expenses	155	(220)
Operating lease liability	(65)	-
Net cash used in operating activities	(5,092)	(5,456)
Investing activities		
Proceeds from maturities of available-for-sale investments	2,500	7,515
Proceeds from sale of available-for-sale investments	-	1,999
Purchase of property and equipment	(16)	(9)
Net cash provided by investing activities	2,484	9,505
Effect of exchange rate changes on cash	-	137
Decrease in cash, cash equivalents and restricted cash	(2,608)	4,186
Cash, cash equivalents and restricted cash, beginning of period	19,393	21,192
Cash, cash equivalents and restricted cash, end of period	$ 16,785	$ 25,378

The accompanying notes are an integral part of these unaudited condensed consolidated financial statements.

1. Organization and Operations

The Company

Proteon Therapeutics, Inc. (the "Company") is a biopharmaceutical company that has historically focused on the development of novel, first-in-class pharmaceuticals to address the medical needs of patients with kidney and vascular disease. The Company was formed in June 2001 and incorporated on March 24, 2006.

On June 22, 2017, the Company entered into a Securities Purchase Agreement (the "Purchase Agreement") with a syndicate of current and new institutional investors, led by an affiliate of Deerfield Management Company, L.P., pursuant to which the Company agreed to issue and sell to the investors an aggregate of 22,000 shares of the Company's Series A Convertible Preferred Stock, par value $0.001 per share (the "Series A Preferred"), for a purchase price of $1,000 per share, or an aggregate gross purchase price of $22.0 million, all upon the terms and conditions set forth in the Purchase Agreement (the "Series A Financing"). The Company closed the Series A Financing on August 2, 2017 (see Note 6).

Pursuant to the Series A Financing, on August 2, 2017, the Company entered into a registration rights agreement with the holders of the Series A Preferred (the "Registration Rights Agreement"). On August 3, 2017, in accordance with the Registration Rights Agreement, the Company filed a registration statement on Form S-3 to register the common stock issuable upon conversion of the Series A Preferred. The registration statement became effective on August 21, 2017. As of March 31, 2019, 340 shares of the Series A Preferred were converted into 341,743 shares of the Company's common Stock.

Recent Developments

On March 28, 2019, the Company announced top-line results from PATENCY-2, its Phase 3 clinical trial of investigational vonapanitase in patients with chronic kidney disease, or CKD, undergoing creation of a radiocephalic fistula for hemodialysis. The PATENCY-2 clinical trial had two co-primary endpoints:

- *Fistula use for hemodialysis*. 69.7 % of vonapanitase-treated patients achieved use of the fistula for hemodialysis, compared to 65.1% of placebo-treated patients (p=0.328), a result that is not statistically significant. Fistula use is defined as use of the fistula for two-needle hemodialysis for at least 90 days or, if hemodialysis was not initiated at least 90 days prior to the last study visit, for at least 30 days and including the patient's last study visit.

- *Secondary patency*. A comparison of the Kaplan-Meier curves did not demonstrate a statistically significant difference in favor of vonapanitase (p=0.932). At the end of one year, 78% of vonapanitase-treated patients maintained secondary patency, compared to 76% of placebo-treated patients. Secondary patency is a measure of the length of time from surgical creation of the fistula until the fistula experiences final failure and must be abandoned.

Top-line results also included data relating to primary unassisted patency, one of PATENCY-2's other efficacy endpoints. Primary unassisted patency is the length of time from fistula surgical creation to the first occurrence of a fistula thrombosis or corrective procedure to restore or maintain patency (blood flow). Vonapanitase-treated patients had a 15% reduction in the risk of primary unassisted patency loss over one year, compared to placebo (p=0.178), a result that is not statistically significant.

The proportions of patients experiencing adverse events were comparable between the vonapanitase and placebo arms of the study. The most common adverse events were consistent with medical events experienced by patients with CKD undergoing creation of a radiocephalic fistula and are summarized in the table below.

Proportions of Patients Experiencing Common Adverse Events

	Vonapanitase N=399	Placebo N=204
Vascular Stenosis	35.1%	41.7%
Fistula Thrombosis	16.8%	18.6%
Local swelling	5.0%	2.0%
Hematoma	5.0%	3.9%

Note: Includes any adverse event that occurred in at least 5% of patients in either treatment group.

Current Strategy

Following the release of top-line data from the PATENCY-2 clinical trial of vonapanitase on March 28, 2019, the Company began to evaluate its strategic alternatives focusing on enhancing stockholder value. It is conducting the process with the assistance of financial and legal advisors and is evaluating the full range of potential strategic alternatives, including but not limited to, a merger or sale of the Company, including a sale of assets or intellectual property, business combinations, joint ventures, public and private capital raises and recapitalization options. Since these efforts may not be successful, it is also considering other possible alternatives, including a wind-down of operations and a liquidation and dissolution of the Company. The Company has discontinued substantially all its research and development activities (see Note 10), including a reduction in workforce, to reduce operating expenses while it evaluates these opportunities. The Company remains subject to a number of risks similar to other companies in the biotechnology industry, including compliance with government regulations, protection of proprietary technology, dependence on third parties and product liability.

As of March 31, 2019, the Company had cash, cash equivalents and available-for-sale investments of $16.8 million. The Company believes that its existing cash, cash equivalents and available-for-sale investments will be sufficient to fund operations and capital expenditures into 2020. The Company had an accumulated deficit of $217.0 million as of March 31, 2019. The Company anticipates operating losses to continue for the foreseeable future due to, among other things, costs related to its administrative organization. These conditions raise substantial doubt about its ability to continue as a going concern within one year after the date that the financial statements are issued. To alleviate the conditions that raise substantial doubt about the Company's ability to continue as a going concern, management has implemented a reduction in expenditures plan and is currently exploring strategic alternatives as a source of funding. While the current reduction in spending expenditure plans will allow the Company to fund its operations in the near-term, there can be no assurance that the Company will be able to achieve its future strategic alternatives raising substantial doubt about its ability to continue as a going concern. Accordingly, the Company has prepared the financial statements on the going concern basis.

2. Summary of Significant Accounting Policies

Basis of Presentation, Principles of Consolidation and Use of Estimates

The unaudited interim condensed consolidated financial statements of the Company included herein have been prepared, pursuant to the rules and regulations of the Securities and Exchange Commission (the "SEC"). Certain information and footnote disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States of America have been condensed or omitted from this report, as is permitted by such rules and regulations. Accordingly, these condensed consolidated financial statements should be read in conjunction with the financial statements as of and for the year ended December 31, 2018 and notes thereto, included in the Company's Annual Report on Form 10-K, as filed with the SEC on March 13, 2019.

The unaudited interim condensed consolidated financial statements have been prepared on the same basis as the audited financial statements. In the opinion of the Company's management, the accompanying unaudited interim condensed consolidated financial statements contain all adjustments which are necessary to fairly present the Company's financial position as of March 31, 2019, the results of its operations for the three months ended March 31, 2019 and 2018 and its cash flows for the three months ended March 31, 2019 and 2018. Such adjustments are of a normal and recurring nature. The results for the three months ended March 31, 2019 are not necessarily indicative of the results for the year ending December 31, 2019, or for any future period.

The unaudited interim condensed consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation. These condensed consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP"). Any reference in these notes to applicable guidance is meant to refer to the authoritative United States generally accepted accounting principles as found in the Accounting Standards Codification ("ASC") and Accounting Standards Update ("ASU") of the Financial Accounting Standards Board ("FASB").

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, the Company's management evaluates its estimates, which include, but are not limited to, estimates related to stock-based compensation expense, clinical trial accruals and reported amounts of revenues and expenses during the reported period. The Company bases its estimates on historical experience and other market-specific or other relevant assumptions that it believes to be reasonable under the circumstances. Actual results may differ from those estimates or assumptions.

Fair Value of Financial Instruments

The Company's financial instruments consist of cash and cash equivalents, available-for-sale investments, accounts payable, and accrued liabilities. The Company is required to disclose information on all assets and liabilities reported at fair value that enables an assessment of the inputs used in determining the reported fair values. FASB ASC Topic 820, *Fair Value Measurement and Disclosures*, established a hierarchy of inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that the observable inputs be used when available. Observable inputs are inputs that market participants would use in pricing the financial instrument based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the financial instrument and are developed based on the best information available under the circumstances. The fair value hierarchy applies only to the valuation inputs used in determining the reported or disclosed fair value of the financial instruments and is not a measure of the investment credit quality. Fair value measurements are classified and disclosed in one of the following three categories:

Level 1—Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access at the measurement date.

Level 2—Valuations based on quoted prices for similar assets or liabilities in markets that are not active or for which all significant inputs are observable, either directly or indirectly.

Level 3—Valuations that require inputs that reflect the Company's own assumptions that are both significant to the fair value measurement and unobservable.

To the extent that valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Financial instruments measured at fair value on a recurring basis include cash equivalents and available-for-sale investments. There have been no changes to the valuation methods utilized by the Company during the three months ended March 31, 2019 and 2018. The Company evaluates transfers between levels at the end of each reporting period. There were no transfers of financial instruments between levels during the three months ended March 31, 2019 and 2018.

Net Income (Loss) per Share Attributable to Common Stockholders

Basic net income (loss) per share is calculated by dividing net income (loss) attributable to common stockholders by the weighted-average number of common shares outstanding during the period. Diluted net income per share is calculated by dividing the net income attributable to common stockholders by the weighted-average number of common equivalent shares outstanding for the period, including any dilutive effect from outstanding stock options and warrants using the treasury stock method.

The Company follows the two-class method when computing net income (loss) per share in periods when issued shares that meet the definition of participating securities are outstanding. The two-class method determines net income (loss) per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income available to common stockholders for the period to be allocated between common and participating securities based upon their respective rights to receive dividends as if all income for the period had been distributed. Accordingly, in periods in which the Company reports a net loss attributable to common stockholders when participating securities are outstanding, losses are not allocated to the participating securities. For purposes of calculating diluted net income per share attributable to common stockholders, preferred stock, stock options, warrants and convertible debt are considered common stock equivalents.

Recent Accounting Pronouncements

In May 2014, the FASB issued ASU 2014-09, Revenue from Contracts with Customers ("ASU 2014-09"), a new standard on revenue recognition providing a single, comprehensive revenue recognition model for all contracts with customers. The new revenue standard is based on the principle that revenue should be recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The new standard was effective beginning January 1, 2018, with early adoption permitted. The Company adopted ASU 2017-09 during the quarter ended March 31, 2018. The adoption did not have a material impact on the consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842): Amendments to FASB Codification ("ASU 2016-02"), which increases transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. At the lease commencement date, the lessee must recognize a lease liability and right-of-use asset, which is initially measured at the present value of future lease payments. The Company adopted ASU 2016-01 at January 1, 2019 using the optional transition method that allows for a cumulative-effect adjustment in the period of adoption and will not restate prior periods. It has have also elected to adopt the package of practical expedients permitted in Accounting Standards Codification Topic 842, or ASC 842. Accordingly, it is are continuing to account for its existing an operating lease as operating lease under the new guidance, without reassessing whether the contract contains a lease under ASC 842 or whether classification of the operating leases would be different under ASC Topic 842, and to treat lease and non-lease components as a single lease component. The Company's sole lease at the adoption date was an operating lease for facilities and did not include any non-lease components.

As a result of the adoption of ASU 2016-02, on January 1, 2019, the Company recognized (a) a lease liability of approximately $0.2 million, which represents the present value of its remaining lease payments using an estimated incremental borrowing rate of 8%, (b) a right-of-use asset of approximately $0.2 million that will be expensed as operating lease expense over the term of the lease. Due to the adoption of the standard using the retrospective cumulative-effect adjustment method, there are no changes to previously reported results prior to January 1, 2019. Lease expense is not expected to change materially as a result of the adoption of ASU 2016-02.

In August 2016, the FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments ("ASU 2016-15"), which provides clarification regarding how certain cash receipts and cash payments are presented and classified in the statement of cash flows. This update addresses eight specific cash flow issues with the objective of reducing the existing diversity in practice. This update is effective for annual and interim periods beginning after December 15, 2017, which required the Company to adopt these provisions in the first quarter of fiscal 2018 using a retrospective approach. The Company adopted ASU 2016-15 during the quarter ended March 31, 2018. The adoption did not have a material impact on the condensed consolidated financial statements.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows, Restricted Cash requiring restricted cash and restricted cash equivalents to be included with cash and cash equivalents on the statement of cash flows when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The guidance is effective for interim and annual periods beginning after December 15, 2017, with early adoption permitted. The Company adopted this standard during the first quarter of 2018. Restricted cash is now included as a component of cash, cash equivalents, and restricted cash on the Company's unaudited condensed consolidated statement of cash flows. Restricted cash is recorded within other non-current assets in the accompanying unaudited condensed consolidated balance sheets. The Company adopted ASU 2016-18 during the quarter ended March 31, 2018. The inclusion of restricted cash increased the beginning balances of the unaudited consolidated statement of cash flows by $22,000 and the ending balances by $22,000 for both the three months ended March 31, 2019 and 2018.

In May 2017, the FASB issued ASU No. 2017-09, Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting ("ASU 2017-09"), which clarifies when changes to the terms or conditions of a share-based payment award must be accounted for as modifications. The new guidance will reduce diversity in practice and result in fewer changes to the terms of an award being accounted for as modifications. Under ASU 2017-09, an entity will not apply modification accounting to a share-based payment award if the award's fair value, vesting conditions and classification as an equity or liability instrument are the same immediately before and after the change. ASU 2017-09 will be applied prospectively to awards modified on or after the adoption date. The guidance is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017. The Company adopted ASU 2017-09 during the quarter ended March 31, 2018. The adoption did not have a material impact on the condensed consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, Compensation - Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting ("ASU 2018-07"). ASU 2018- 07 aims to simplify the accounting for share-based payments to nonemployees by aligning it to the accounting for share based payments to employees including determining the fair value of the award on the date of grant and recognizing the stock-based compensation expense as of the respective vesting date. The new standard also requires companies to elect to either measure the awards to nonemployees over an estimated expected term or contractual term as well as elect to estimate forfeitures or account for forfeitures as incurred. ASU 2018-07 is effective for fiscal years and interim periods within those fiscal years beginning after December 15, 2018. The guidance will be effective for the Company on January 1, 2019. The Company adopted ASU 2018-07 during the quarter ended March 31, 2019. The adoption did not have an impact on the condensed consolidated financial statements as all outstanding non-employee share-based awards had vested prior to March 31, 2018.

3. Fair Value Measurements

Below is a summary of assets and liabilities measured at fair value (in thousands):

	As of March 31, 2019			
	Quoted Prices in Active Markets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets				
Cash equivalents	$ 15,378	$ -	$ -	$ 15,378
Total	$ 15,378	$ -	$ -	$ 15,378

	As of December 31, 2018			
	Quoted Prices in Active Markets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Assets				
Cash equivalents	$ 18,353	$ -	$ -	$ 18,353
Government securities	2,496	-	-	2,496
Total	$ 20,849	$ -	$ -	$ 20,849

As of March 31, 2019 and December 31, 2018, the Company's cash equivalents consist principally of money market funds and government debt securities with original maturities of 90 days or less. Government securities consist principally of government debt securities and money market funds which are classified as available-for-sale.

Available-for-sale securities at March 31, 2019 and December 31, 2018 consist of the following (in thousands):

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
March 31, 2019				
Government securities				
(Due within 1 year)	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -
December 31, 2018				
Government securities				
(Due within 1 year)	$ 2,496	$ -	$ -	$ 2,496
	$ 2,496	$ -	$ -	$ 2,496

4. Property and Equipment, net

Property and equipment, net consists of the following (in thousands):

	As of	
	March 31, 2019	December 31, 2018
Computer equipment and software	$ 227	$ 211
Furniture, fixtures, and other	365	365
Laboratory equipment	514	514
	1,106	1,090
Accumulated depreciation	(1,001)	(827)
Property and equipment, net	$ 105	$ 263

Depreciation expense for the three months ended March 31, 2019 and 2018 was $0.2 million, and $32,000, respectively.

During the three months ended March 31, 2019, the Company voluntarily discontinued substantially all research and development activities and as a result the Company performed an impairment assessment of the laboratory equipment used in development of vonapanitase by comparing the equipment's carrying value to its estimated fair value, which was determined based on the recoverability of the assets remaining value as of March 31, 2019. The analysis resulted in an impairment of the Company's laboratory equipment of $133,000 which was charged to research and development expenses in the three months ended March 31, 2019.

5. Commitments and Contingencies

Operating Lease

The Company's primary facility is located in Waltham, Massachusetts, where it leases approximately 7,495 square feet of office space. In July 2018, it amended the lease extending its expiration to September 2019. During the three months ended March 31, 2019, it recognized operating lease expense of $69,000, including property taxes and routine maintenance expense, which approximated its cash payments for the period. As of March 31, 2019, the condensed consolidated balance sheet includes a $135,000 operating lease right-of-use asset and a $135,000 operating lease liability in other assets and other current liabilities, respectively.

The weighted average remaining lease term and the weighted average discount rate for operating lease at March 31, 2019 was:

	Operating Lease
Weighted average discount rate	8%
Weighted average remaining lease terms (years)	0.5

Future minimum payments required under operating leases as of March 31, 2019 are summarized as follows (in thousands):

Year Ending December 31:	Amount
2019	138
Total minimum lease payments	$ 138

In addition to the base rent, the Company is also responsible for its share of operating expenses and real estate taxes, in accordance with the terms of the lease agreement. As of March 31, 2019, the Company has provided a security deposit in the amount of $22,000 to the lessor.

Restricted cash related to facilities leases

As of March 31, 2019 and December 31, 2018, the Company had $22,000 in an outstanding letter of credit to be used as collateral for leased premises. As of March 31, 2019 and December 31, 2018, the Company pledged an aggregate of $22,000 to the bank as collateral for the letter of credit, which is included in other non-current assets.

6. Series A Preferred Financing

On August 2, 2017, the Company issued and sold 22,000 shares of the Company's Series A Convertible Preferred Stock, par value of $0.001 per share (the "Series A Preferred"), for a purchase price of $1,000 per share, or aggregate purchase price and gross proceeds of $22.0 million, all upon the terms and conditions set forth in the Securities Purchase Agreement dated as of June 22, 2017. The Company incurred $0.5 million of issuance costs in connection with the transaction. Each share of Series A Preferred is convertible into approximately 1,005 shares of the Company's Common Stock at a conversion price of $0.9949 per share, in each case subject to adjustment for any stock splits, stock dividends and similar events, provided that any conversion of Series A Preferred by a holder into shares of Common Stock is prohibited if, as a result of such conversion, the holder, together with its affiliates and any other person or entity whose beneficial ownership of the Company's Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") would beneficially own more than 9.985% of the total number of shares of Common Stock issued and outstanding after giving effect to such conversion.

Upon issuance, each share of Series A Preferred included an embedded beneficial conversion feature as the market price of the Company's Common Stock on the date of issuance of the Series A Preferred was $1.30 per share. As a result, the Company recorded the intrinsic value of the beneficial conversion feature of $6.7 million as a discount on the Series A Preferred at issuance. As the Series A Preferred is immediately convertible upon issuance and does not include a stated redemption date, the discount on the Series A Preferred was immediately accreted.

The Company evaluated the Series A Preferred for liability or equity classification in accordance with the provisions of ASC 480, Distinguishing Liabilities from Equity, and determined that equity treatment was appropriate because the Series A Preferred did not meet the definition of the liability instruments defined thereunder for convertible instruments. Specifically, the Series A Preferred are not mandatorily redeemable and do not embody an obligation to buy back the shares outside of the Company's control in a manner that could require the transfer of assets. Additionally, the Company determined that the Series A Preferred would be recorded as permanent equity, not temporary equity, based on the guidance of ASC 480 given that there is no scenario where the holders of equally and more subordinated equity of the entity would not be entitled to also receive the same form of consideration upon the occurrence of the event that gives rise to the redemption.

As of March 31, 2019, 340 shares of the Series A convertible preferred stock were converted into 341,743 shares of Common Stock. The Company had issued and outstanding 21,660 share of Series A convertible preferred stock with a par value of $0.001 at March 31, 2019.

7. Stock-based Compensation

Stock Options

The following table summarizes stock option activity for employees:

	Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at December 31, 2018	4,597,226	$ 5.12	7.4	$ 404
Granted	1,182,500	$ 2.66		
Exercised	-			
Forfeited	-			
Expired	-			
Outstanding at March 31, 2019	5,779,726	$ 4.62	7.4	$ -
Exercisable at March 31, 2019	2,606,279	$ 6.75	6.1	$ -
Vested or expected to vest at March 31, 2019 (1)	5,779,726	$ 4.62	7.4	$ -

(1) Represents the number of vested options at March 31, 2019 plus the number of unvested options expected to vest based on the unvested options outstanding at March 31, 2019

Employee Stock Purchase Plan

The 2014 Employee Stock Purchase Plan (ESPP) initially authorized the issuance of up to 140,500 shares of Common Stock. The number of shares increases each January 1, commencing on January 1, 2015 and ending on (and including) January 1, 2024, by an amount equal to the lesser of one percent of the outstanding shares as of the end of the immediately preceding fiscal year, 281,000 shares and any lower amount determined by the Company's Board of Directors prior to each such January 1st. As of March 31, 2019, as a result of an increase on January 1, 2019 of one percent of the outstanding shares as of the end of the fiscal year ending December 31, 2018, the 2014 ESPP authorized the issuance of up to 192,436 shares of Common Stock. The ninth offering under the 2014 ESPP began on January 1, 2019 and ends on June 30, 2019. No shares were issued during the three months ended March 31, 2019 and 2018 under the 2014 ESPP. The Company incurred $50,900 and $24,000 in stock-based compensation expense related to the 2014 ESPP for the three months ended March 31, 2019 and 2018, respectively.

Common Stock

The Company has the following shares of Common Stock reserved for future issuance:

	March 31, 2019	December 31, 2018
Conversion of Series A Preferred Stock	21,771,032	22,112,775
Stock-based compensation awards	6,818,214	5,163,957
Employee Stock Purchase Plan	118,120	118,120
Total	28,707,366	27,394,852

8. Income Taxes

Deferred taxes are recognized for temporary differences between the basis of assets and liabilities for financial statement and income tax purposes. The Company has evaluated the positive and negative evidence bearing upon the Company's ability to realize the benefit of its deferred tax assets. Based on the Company's history of operating losses, the Company has concluded that it is more likely than not that the benefit of its deferred tax assets will not be realized. Due to the uncertainty surrounding the realization of the favorable tax attributes in future tax returns, the Company has provided a full valuation allowance against its deferred tax assets. There were no significant income tax provisions or benefits for the three months ended March 31, 2019 and 2018.

9. Net Loss per Share Attributable to Common Stockholders

As described in Note 2, Summary of Significant Accounting Policies, the Company computes basic and diluted loss per share using a methodology that gives effect to the impact of outstanding participating securities (the "two-class method"). As the three months ended March 31, 2019 and 2018 resulted in net losses, there is no income allocation required under the two-class method or dilution attributed to weighted-average shares outstanding in the calculation of diluted loss per share.

The following Common Stock equivalents, presented on an as converted basis, were excluded from the calculation of net loss per share for the periods presented, due to their anti-dilutive effect:

	Three Months Ended March 31,	
	2019	2018
Outstanding stock options	5,779,726	4,380,937
Outstanding ESPP shares	267,242	55,716
Convertible preferred stock	21,771,032	22,112,775
	27,818,000	26,549,428

10. Subsequent Events

Following the release of top-line data from the PATENCY-2 clinical trial of vonapanitase, the Company began to evaluate its strategic alternatives focusing on enhancing stockholder value, including the possibility of a merger or sale of the Company. On April 15, 2019, the Company announced the engagement of H.C. Wainwright & Co., LLC as its financial advisor to assist in the strategic review process.

As a result of these strategic alternatives and in connection with the Company's discontinuation of research and development activities, the Company has terminated or expects to terminate all but four of its employees by the end of May 2019.In 2019, the Company expects to incur severance costs of between $3.0 million and $3.2 million.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

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 the unaudited condensed consolidated financial statements and related notes appearing elsewhere in this Quarterly Report on Form 10-Q.

Our actual results and timing of certain events may differ materially from the results discussed, projected, anticipated, or indicated in any forward-looking statements. We caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and the development of the industry in which we operate may differ materially from the forward-looking statements contained in this Quarterly Report. In addition, even if our results of operations, financial condition and liquidity, and the development of the industry in which we operate are consistent with the forward-looking statements contained in this Quarterly Report, they may not be predictive of results or developments in future periods.

Overview

We are a biopharmaceutical company that has historically focused on the development of novel, first-in-class pharmaceuticals to address the medical needs of patients with kidney and vascular disease. Our product candidate, vonapanitase, is a recombinant human elastase that we developed to improve vascular access outcomes in patients with chronic kidney disease, or CKD, undergoing or preparing for hemodialysis, a lifesaving treatment that cannot be conducted without a functioning vascular access. On March 28, 2019, we announced that our second Phase 3 trial, PATENCY-2, for vonapanitase in radiocephalic fistulas did not meet its co-primary endpoints of fistula use for hemodialysis (p=0.328) and secondary patency (p=0.932). The PATENCY-2 clinical trial was the second of two randomized, double-blind Phase 3 trials, comparing a 30 microgram dose of investigational vonapanitase to placebo. We reported top-line results for the first Phase 3 clinical trial, PATENCY-1, in December 2016 and published these results in the Journal of Vascular Surgery in January 2019. As in PATENCY-1, the PATENCY-2 clinical trial enrolled patients with chronic kidney disease undergoing surgical creation of a radiocephalic fistula for hemodialysis. Patients were randomized 2:1, vonapanitase to placebo, and were followed for a period of twelve months. In March 2018, we completed enrollment of a total of 603 treated patients at 39 centers in the U.S. and Canada. Based on the top-line results of the PATENCY-2 clinical trial, we are no longer planning to submit a Biologics License Application, or BLA, to the U.S. Food and Drug Administration, or FDA, or a Marketing Authorization Application, or MAA, to the European Medicines Agency, or EMA, for investigation vonapanitase.

In April 2019, we discontinued substantially all research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. We also began a plan in April 2019 to reduce personnel and expenses to preserve capital and further reduce our operations consistent with our decision to discontinue research and development activities. We expect to devote significant time and resources to identifying and evaluating strategic alternatives, however, there can be no assurance that such activities will be successful. Further, any strategic transaction that is completed ultimately may not deliver the anticipated benefits or enhance stockholder value.

We commenced business operations in June 2001 and incorporated in March 2006. Our operations to date have been limited to organizing and staffing our company, business planning, raising capital, undertaking preclinical studies and clinical trials of vonapanitase, protecting our intellectual property and providing general and administrative support for these operations. To date, we have not generated any product revenue and have primarily financed our operations through the private placement of our equity securities, business development activities, convertible note financings, and our initial public offering, or IPO, completed in October 2014.

As of March 31, 2019, we had received an aggregate of $200.1 million in net proceeds comprised of $115.5 million from the issuance of private equity securities, $7.7 million from the issuance of convertible notes, $10.0 million from business development activities, $0.2 million from government grants, $62.5 million from our IPO and $4.2 million from the sale of Common Stock under our at-the-market, or ATM, program with Cowen and Company, LLC.

We have never been profitable and have incurred net losses in each year since inception. As of March 31, 2019, we had an accumulated deficit of $217.0 million and our net loss for the three months ended March 31, 2019 was $6.5 million. We expect to incur significant expenses for the foreseeable future. We expect our research and development expenses to decrease, excluding severance payments, as we discontinue our research and development activities, further reduce headcount, and focus on evaluating our strategic alternatives with the goal to enhance stockholder value, including the possibility of a merger or sale of the Company.

We believe that our cash and cash equivalents and available-for-sale investments at March 31, 2019 will be sufficient to fund our operating expenses and capital expenditure requirements into 2020. As of March 31, 2019, we had approximately $16.8 million in existing cash, cash equivalents and marketable securities. Based on these available cash resources, we have sufficient cash on hand to support current operations for at least the next twelve months from the date of filing this Quarterly Report on Form 10-Q. For more information, refer to "—Liquidity and Capital Resources" below and Note 1 to our condensed consolidated financial statements included elsewhere in this Quarterly Report on Form 10-Q.

We do not expect to generate revenue from product sales. We have no manufacturing facilities and all of our manufacturing activities are contracted out to third parties. Additionally, we have used third-party clinical research organizations, or CROs, to carry out our clinical development activities and we do not yet have a sales organization.

Financial Overview

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for the development of vonapanitase, which include:

- employee-related expenses, including salaries, benefits, travel and stock-based compensation expense;
- expenses incurred under agreements with clinical research organizations, or CROs and investigative sites that will conduct our clinical trials;
- the cost of acquiring, developing and manufacturing clinical trial materials;
- costs associated with regulatory operations; and
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance and other supplies.

In April 2019, we initiated plans to discontinue research and development activities to reduce operating expenses. We will continue to expense the remaining research and development costs to operations as incurred. We recognize costs for certain development activities, such as clinical trials, based on an evaluation of the progress to completion of specific tasks using data such as patient enrollment, clinical site activations or information provided to us by our vendors.

Our efforts to discontinue development activities include the following:

- we are closing the 39 clinical sites that participated in our second Phase 3 trial, PATENCY-2, and terminating the long-term follow-up patient registry, all of which we expect to be completed before the end of May 2019.
- we initiated two Phase 1 clinical trials of vonapanitase in patients with peripheral artery disease, or PAD, in the fourth quarter of 2016. These multicenter, dose-escalation trials are designed to evaluate the safety and technical feasibility of a single administration of vonapanitase as a monotherapy and as an adjunct to angioplasty for patients with PAD above the knee and below the knee, respectively. In 2018, we completed the enrollment and treatment of 24 patients in the Phase 1 trial evaluating vonapanitase as an adjunct to angioplasty for PAD below the knee. We had planned to enroll up to an additional 16 patients in this study before the end of 2019 and to follow each of these patients for period of up to seven months. However, based on our current operating plan, we have decided not to continue patient enrollment in the Phase 1 trial evaluating vonapanitase below the knee and we do not expect to begin patient enrollment in the Phase 1 trial evaluating vonapanitase as a monotherapy above the knee;
- we have discontinued all activities relating to the manufacture of clinical trial materials in support of our clinical trials and process validation activities that were undertaken in anticipation of a potential BLA submission.

Marketing, General and Administrative Expenses

Marketing, general and administrative expenses consist principally of salaries and related costs for personnel, including stock-based compensation and travel expenses, in executive and other administrative functions. Other marketing, general and administrative expenses also include professional fees for legal, patent review, consulting and accounting services as well as facility related costs, as well as expenses related to audit, legal, regulatory and tax-related services associated with maintaining compliance with our NASDAQ listing and SEC requirements, director and officer liability insurance premiums and investor relations costs associated with being a public company.

Investment Income

Investment income consists of interest income earned on our cash, cash equivalents and marketable securities.

Other Income (Expense), Net

Other income (expense), net consists of the gain realized from non-cash gains and losses from currency exchange rate fluctuations on transactions or balances denominated in a foreign currency. This foreign currency exposure is the result of a contract with the manufacturer of active pharmaceutical ingredient, or API for our lead product candidate, vonapanitase, which required us to make payments in Swiss Francs.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial position and results of operations is based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America, or GAAP. The preparation of financial statements in conformity with GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, we evaluate estimates, which include estimates related to clinical trial accruals, stock-based compensation expense, and reported amounts of revenues and expenses during the reported period. We base our estimates on historical experience and other market-specific or other relevant assumptions that we believe to be reasonable under the circumstances. Actual results may differ materially from those estimates or assumptions.

There have been no material changes to our accounting policies from those described in our Annual Report on Form 10-K for the year ended December 31, 2018, as filed with the SEC on March 13, 2019. It is important that the discussion of our operating results that follows be read in conjunction with the critical accounting policies disclosed in our Annual Report on Form 10-K for the year ended December 31, 2018, as filed with the SEC on March 13, 2019.

Results of Operations

Comparison of the Three Months Ended March 31, 2019 and 2018

The following table summarizes our results of operations for the three months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,		
	2019	2018	Period-to-Period Change
Operating expenses:			
Research and development	$ 4,048	$ 4,071	$ (23)
General and administrative	2,589	2,294	295
Total operating expenses	6,637	6,365	272
Loss from operations	(6,637)	(6,365)	(272)
Other income:			
Investment income	105	92	13
Other income, net	1	192	(191)
Total other income	106	284	(178)
Net Loss	$ (6,531)	$ (6,081)	$ (450)

Research and Development Expenses. The following table identifies research and development expenses on both an external and internal basis for the three months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,		
	2019	2018	Period-to-Period Change
External vonapanitase research and development expenses	$ 2,877	$ 2,923	$ (46)
Internal research and development expenses	1,171	1,148	23
Total research and development expenses	$ 4,048	$ 4,071	$ (23)

During the three months ended March 31, 2019, our total research and development expenses decreased by an immaterial amount.

Marketing, General and Administrative Expenses. During the three months ended March 31, 2019, our total marketing, general and administrative expenses were $0.3 million higher as compared to the three months ended March 31, 2018 primarily due to $0.2 million in higher expenses to support our ongoing corporate activities and $0.1 million in higher expenses associated with being a public, reporting company in the three months ended March 31, 2019 as compared to the three months ended March 31, 2018.

Investment Income. During the three months ended March 31, 2019, investment income increased by an immaterial amount.

Other Income, Net. During the three months ended March 31, 2019, other expense, net, decreased by $0.2 million as compared to the three months ended March 31, 2018 primarily due to primarily due to no longer having foreign currency remeasurement gain for cash denominated in Swiss Francs.

Liquidity and Capital Resources

Overview

Since our inception and through the three months ended March 31, 2019, we had received $200.1 million in net proceeds comprised of $115.5 million from the issuance of private equity securities, $7.7 million from the issuance of convertible notes, $10.0 million from business development activities, $0.2 million from government grants, $62.5 million from our IPO and $4.2 million from the sale of Common Stock under our now-terminated at-the-market, or ATM, program with Cowen and Company, LLC. As of March 31, 2019, our cash and cash equivalents and available-for-sale investments totaled $16.8 million.

Operating Capital Requirements

We expect to incur ongoing operating losses for the foreseeable future as we evaluate our strategic alternatives. Even if we enter into a strategic transaction, the combined entity may not be able to complete the clinical development of vonapanitase and obtain approval of vonapanitase from the FDA or EMA.

We believe that our cash and cash equivalents and available-for-sale investments as of March 31, 2019 will be sufficient to fund our operations into 2020.

Our forecast of 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. We have based this estimate on assumptions that may prove to be wrong and we could exhaust our available capital resources sooner than we currently expect. Our future funding requirements, both near and long-term, will depend on many factors, including:

- our ability to identify and consummate a strategic transaction for the Company;
- the timing and nature of any strategic transactions that we undertake
- whether we enter into a partnership or business combination;
- the terms and timing of any future collaborations, licensing, consulting or other arrangements that we may establish; and
- the costs of preparing, filing and prosecuting patent applications, maintaining and protecting our intellectual property rights and defending against intellectual property related claims.

Cash Flows

The following table summarizes our sources and uses of cash for the three months ended March 31, 2019 and 2018 (in thousands):

	Three Months Ended March 31,	
	2019	**2018**
Net cash used in operating activities	$ (5,092)	$ (5,456)
Net cash provided by investing activities	2,484	9,505
Effect of exchange rate changes on cash	-	137
Net (decrease) increase in cash, cash equivalents, and restricted cash	$ (2,608)	$ 4,186

Comparison of the Three Months Ended March 31, 2019 and 2018

Net cash used in operating activities was $5.1 million for the three months ended March 31, 2019 compared to $5.5 million for the three months ended March 31, 2018. The decrease of $0.4 million in cash used in operating activities was primarily driven by a $0.8 million decrease in cash outflows related to changes in the components of working capital offset by an increase in our net loss of $0.4 million, as compared to the three months ended March 31, 2018

Net cash provided by investing activities was $2.5 million for the three months ended March 31, 2019 compared to $9.5 million provided in the three months ended March 31, 2018. The change of $7.0 million in cash provided by investing activities was driven by a decrease in cash inflows of $7.0 million due to lower proceeds from maturities and sales of available-for-sale investments in the three months ended March 31, 2019 as compared to the three months ended March 31, 2018.

Off-Balance Sheet Arrangements

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

Contractual Obligations

The following table summarizes our outstanding contractual obligations as of payment due date by period at March 31, 2019:

	Total	Less than 1 Year	1 to 3 Years	3 to 5 Years	More than 5 Years
Operating Leases (1)	$ 138	$ 138	$ -	-	-

(1) In July 2009 we entered into a multi-year non-cancelable lease for our offices in Waltham, Massachusetts. In October 2011, we amended the lease extending its expiration to December 2014. In August 2014, we amended the lease extending its expiration to June 2018 with one optional one-year extension period. In August 2017, we amended the lease extending its expiration to September 2019 with one optional one-year extension period. The minimum lease payments above do not include common area maintenance charges or real estate taxes.

JOBS Act

In April 2012, the Jumpstart Our Business Startups Act, or JOBS Act was enacted in the United States. Section 107 of the JOBS Act provides that an "emerging growth company," or EGC, can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. Thus, an emerging growth company can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth public companies.

Item 3. Qualitative and Quantitative Disclosures about Market Risk

The market risk inherent in our financial instruments and in our financial position represents the potential loss arising from adverse changes in interest rates. As of March 31, 2019, we had cash equivalents and available-for-sale investments of $16.8 million consisting primarily of investments in U.S. Treasuries and certificates of deposit. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments are in short-term marketable securities. Our marketable securities are subject to interest rate risk and could fall in value if market interest rates increase. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our investment portfolio. We have the ability to hold our marketable securities until maturity, and therefore, we would not expect our operating results or cash flows to be affected to any significant degree by the effect of a change in market interest rates on our investments.

We contract with CROs and contract manufacturers internationally. Transactions with one of our contract manufacturers is settled in Swiss Francs and therefore, while we believe we have some foreign currency exposure, we have entered into forward foreign currency contracts to purchase Swiss Francs to manage this risk. The last outstanding forward foreign currency contract was executed during December 2016.

Item 4. Controls and Procedures

Management's Evaluation of our Disclosure Controls and Procedures

We maintain disclosure controls and procedures (as defined in Rules 13a-15(e) or 15d-15(e) under the Exchange Act) that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is (1) recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms and (2) accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

As of March 31, 2019, our management, with the participation of our principal executive officer and principal financial officer, evaluated the effectiveness of our disclosure controls and procedures as of the end of the period covered by this Quarterly Report. 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 management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our principal executive officer and principal financial officer have concluded based upon the evaluation described above that, as of March 31, 2019, our disclosure controls and procedures were effective at the reasonable assurance level.

We continue to review and document our disclosure controls and procedures, including our internal controls and procedures for financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

Changes in Internal Control Over Financial Reporting

During the three months ended March 31, 2019, we implemented certain internal controls in connection with our adoption of ASC 842. There were no other changes in our internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15(d)-15(f) promulgated under the Securities Exchange Act of 1934, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II – OTHER INFORMATION

Item 1. Legal Proceedings

From time to time we may become subject to various legal proceedings and claims that arise in the ordinary course of our business activities. Although the results of litigation and claims cannot be predicted with certainty, as of the date of this Quarterly Report on Form 10-Q, we do not believe we are party to any claim or litigation, the outcome of which, if determined adversely to us, would individually or in the aggregate be reasonably expected to have a material adverse effect on our business. Regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 1A. Risk Factors

Any investment in our Common Stock involves a high degree of risk. The following risk factors and other information included in this Quarterly Report on Form 10-Q should be carefully considered. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business. We refer you to our "Cautionary Note Regarding Forward-Looking Statements," which identifies certain forward-looking statements contained in this report that are qualified by these risk factors. If any of the following risks occur, our business, financial condition, results of operations and future growth prospects could be materially and adversely affected.

Risks Related to Our Evaluation of Strategic Alternatives

Our business to date has been almost entirely dependent on the success of vonapanitase, and we have decided to discontinue further development of vonapanitase and devote significant time and resources to identifying and evaluating strategic alternatives, which may not be successful.

To date, we have invested substantially all of our efforts and financial resources in the research and development of our lead indication for vonapanitase in radiocephalic fistulas, which was our only product candidate to enter Phase 3 clinical trials. On March 28, 2019, we announced that our second Phase 3 trial, PATENCY-2, did not meet its co-primary endpoints of fistula use for hemodialysis (p=0.328) and secondary patency (p=0.932). In April 2019, based on the results of the PATENCY-2 clinical trial, we discontinued research and development activities to reduce operating expenses, including a reduction in our workforce, to preserve our cash resources while we evaluate our strategic alternatives with a goal to maximize stockholder value, including the possibility of a merger or sale of our company. We have retained H.C. Wainwright & Co., LLC to advise and assist us in this strategic review, along with legal advisors. There can be no assurance that our process to identify and evaluate potential strategic alternatives will result in any definitive offer to consummate a strategic transaction, or if made that the terms thereof will be acceptable to the Company. If any definitive offer to consummate a strategic transaction is received, there can be no assurance that a definitive agreement will be executed or that, if a definitive agreement is executed, the transaction will be consummated. In addition, there can be no assurance that any transaction, involving our company and/or assets, that is consummated would enhance stockholder value. There also can be no assurance that we will conduct further drug research or development activities in the future.

If we do not successfully consummate a strategic transaction, our board of directors may decide to pursue a dissolution and liquidation of our company. In such an event, the amount of cash available for distribution to our stockholders will depend heavily on the timing of such liquidation as well as the amount of cash that will need to be reserved for commitments and contingent liabilities.

There can be no assurance that the process to identify a strategic transaction will result in a successfully consummated transaction. If no transaction is completed, our board of directors may decide to pursue a dissolution and liquidation of our company. In such an event, the amount of cash available for distribution to our stockholders will depend heavily on the timing of such decision and, ultimately, such liquidation, since the amount of cash available for distribution continues to decrease as we fund our operations while we evaluate our strategic alternatives. In addition, if our board of directors were to approve and recommend, and our stockholders were to approve, a dissolution and liquidation of our company, we would be required under Delaware corporate law to pay our outstanding obligations, as well as to make reasonable provision for contingent and unknown obligations, prior to making any distributions in liquidation to our stockholders. Our commitments and contingent liabilities may include (i) obligations under our employment and related agreements with certain employees that provide for severance and other payments following a termination of employment occurring for various reasons, including a change in control of our company; (ii) potential litigation against us, and other various claims and legal actions arising in the ordinary course of business; and (iii) non-cancelable obligations. As a result of this requirement, a portion of our assets may need to be reserved pending the resolution of such obligations. In addition, we may be subject to litigation or other claims related to a dissolution and liquidation of our company. If a dissolution and liquidation were pursued, our board of directors, in consultation with its advisors, would need to evaluate these matters and make a determination about a reasonable amount to reserve. Accordingly, holders of our common stock could lose all or a significant portion of their investment in the event of a liquidation, dissolution or winding up of our company.

If we are successful in completing a strategic transaction, we may be exposed to other operational and financial risks.

Although there can be no assurance that a strategic transaction will result from the process we have undertaken to identify and evaluate strategic alternatives, the negotiation and consummation of any such transaction will require significant time on the part of our management, and the diversion of management's attention may disrupt our business. The negotiation and consummation of any such transaction may also require more time or greater cash resources than we anticipate and expose us to other operational and financial risks, including:

- increased near-term or long-term expenditures;
- exposure to unknown liabilities;
- incurrence of substantial debt or dilutive issuances of equity securities to pay for acquisitions;
- higher-than-expected acquisition and integration costs;
- write-downs of assets or goodwill or impairment charges;
- increased amortization expenses;
- difficulty and cost in combining the operations and personnel of any acquired businesses with our operations and personnel;
- impairment of relationships with key suppliers or customers of any acquired businesses due to changes in management and ownership; and
- inability to retain key employees of our company or any acquired businesses.

Any of the foregoing risks could have a material adverse effect on our business, financial condition and prospects.

We are substantially dependent on our remaining employees to facilitate the consummation of a strategic transaction.

Our ability to successfully complete a strategic transaction depends in large part on our ability to retain certain of our remaining personnel, particularly Timothy Noyes, our President and Chief Executive Officer and George Eldridge, our Senior Vice President, Chief Financial Officer, Treasurer and Secretary. Despite our efforts to retain these employees, one or more may terminate their employment with us on short notice. The loss of the services of any of our employees could potentially harm our ability to evaluate and pursue strategic alternatives, as well as fulfill our reporting obligations as a public company. In connection with our discontinuation of research and development activities, by the end of May 2019 we plan to terminate all but four of our employees including all of our executive officers, with exception of Messrs. Noyes and Eldridge.

We may not realize any additional value in a strategic transaction for our intellectual property.

The market capitalization of our company is or may be below the value of our cash, cash equivalents and marketable securities at the time of consummation of any strategic transaction. Although the PATENCY-2 clinical trial failed to meet its co-primary endpoints, we believe that data from preclinical and other clinical studies of vonapanitase may support potential further investigation and development activities. However, potential counterparties in a strategic transaction involving our company may place minimal or no value on our assets, given the limited data regarding their potential application. Further, the development and any potential commercialization of investigational vonapanitase will require substantial additional funding associated with conducting the necessary clinical testing and obtaining regulatory approval. Consequently, any potential counterparty in a strategic transaction involving our company may choose not to spend additional resources and continue development of vonapanitase and may attribute little or no value, in such a transaction, to vonapanitase or our other intellectual property.

We could be subject to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following certain significant business transactions, such as the sale of a company or announcement of other strategic transactions, or the announcement of negative events, such as negative results from clinical trials. These events may also result in investigations by the Securities and Exchange Commission. We may be exposed to such litigation or investigation even if no wrongdoing occurred. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business and our ability to consummate a potential strategic transaction or the ultimate value our stockholders receive in any such transaction.

Although we have ceased all further development of vonapanitase, if we were to resume research and development activities, we would require substantial additional funding. Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies or to a product candidate.

We currently do not have any external source of funds and do not expect to generate any revenue. We believe that our existing cash, cash equivalents and marketable securities and interest thereon will be sufficient to fund our projected operating requirements under our current operating plan, which is to seek a strategic alternative to maximize stockholder value, and into 2020. We have based our estimates on assumptions that may prove to be wrong, and we may use our available capital resources sooner than we currently expect if our operating plans change. If our current operating plans change and we determine to pursue further research and development activities, we will require substantial additional funding to operate, and would expect to finance these cash needs through a combination of equity offerings, debt financings, government or other third-party funding and licensing or collaboration arrangements.

To the extent that we raise additional capital through the sale of equity or convertible debt, the ownership interests of our stockholders will be diluted. In addition, the terms of any equity or convertible debt we agree to issue may include liquidation or other preferences that adversely affect the rights of our stockholders. Convertible debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, and declaring dividends, and may impose limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business.

Additional funds may not be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to further curtail or cease our operations or we may have to relinquish valuable rights to our technologies, any future revenue streams, research programs or product candidates, or grant licenses on terms that may not be favorable to us

Risks Related to Our Historical Business Operations and Financial Condition

We have identified conditions and events that raise substantial doubt about our ability to continue as a going concern.

As of March 31, 2019, we had approximately $16.8 million in existing cash, cash equivalents and available-for-sale investments, and an accumulated deficit of $217.0 million. We believe that our existing cash, cash equivalents and available-for-sale investments will be sufficient to fund operations and capital expenditures into 2020; however, we anticipate operating losses to continue for the foreseeable future due to, among other things, costs related to its administrative organization. These conditions raise substantial doubt about our ability to continue as a going concern within one year after the date that the financial statements are issued. To alleviate the conditions that raise substantial doubt about our ability to continue as a going concern, management has implemented a reduction in expenditures plan and is currently exploring strategic alternatives as a source of funding. While the current reduction in spending expenditure plans will allow us to fund our operations in the near-term, we cannot guarantee that we will be able to successfully implement a strategic transaction or obtain sufficient additional funding when needed or that such funding, if available, will be obtainable on terms satisfactory to us. In the event that these plans cannot be effectively realized, there can be no assurance that we will be able to continue as a going concern.

We have a limited operating history and have incurred significant losses since our inception, and we anticipate that we will continue to incur losses for the foreseeable future.

We are a biotechnology company, and we have not commercialized any products or generated any revenues from the sale of products. We have historically devoted substantially all of our efforts and our financial resources to research and development, including our clinical and preclinical development activities. In April 2019, we discontinued substantially all our research and development activities to reduce operating expenses while we evaluate our strategic alternatives with a goal to enhance stockholder value, including the possibility of a merger or sale of the Company. To date, we have financed our operations primarily through the sale of equity securities and, prior to our initial public offering, the sale of convertible debt. We have incurred losses from operations in each year since our inception, and our net losses were $20.7 million and $30.0 million for the years ended December 31, 2018 and 2017, respectively and $6.5 million and $6.1 million for the three months ended March 31, 2019 and 2018, respectively. As of March 31, 2019, we had an accumulated deficit of $217.0 million. We do not expect to generate any product revenues in the foreseeable future. We do not know whether or when we will generate revenue or become profitable.

We expect to continue to incur significant expenses for the foreseeable future. The net losses we incur may fluctuate significantly from quarter to quarter and year to year, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance. In any particular quarter or quarters, our operating results could be below the expectations of securities analysts or investors, which could cause our stock price to decline.

Risks Related to Clinical Development, Regulatory Review and Approval of Our Product

We may be subject to certain federal or state "fraud and abuse" laws and other healthcare laws and regulations. If we are found to be in violation of any such laws or regulations, we may be required to pay a penalty and/or be suspended from participation in federal or state healthcare programs, which may adversely affect our business, financial condition and ability to consummate a strategic transaction.

We may be subject to various federal and state laws pertaining to healthcare "fraud and abuse," including anti-kickback laws and false claims laws. Anti-kickback laws make it illegal for a prescription drug or biologic manufacturer to solicit, offer, receive or pay any remuneration in exchange for, or to induce, the referral of business, including the purchase or prescription of a particular drug or biologic. Other laws that we may be subject to include the civil False Claims Act, criminal False Claims Act, the HIPAA fraud and abuse provisions, the Civil Monetary Penalties statute, Section 1927 of the Social Security Act, the Veterans Health Care Act, the Foreign Corrupt Practices Act, federal and state statutes and regulations pertaining to payments made to physicians and other health care providers, the HIPAA privacy and security provisions, and other analogous state laws. Due to the breadth of the statutory provisions, it is possible that our practices might be challenged under anti-kickback, healthcare, or other fraud and abuse laws. Moreover, recent healthcare reform legislation has strengthened these laws. For example, the Patient Protection and Affordable Care Act, or ACA, among other things, amends the intent requirement of the federal anti-kickback and certain of the criminal healthcare fraud statutes to clarify that a person or entity does not need to have actual knowledge of this statute or specific intent to violate it. In addition, the ACA clarifies that the government may assert that a claim that includes items or services resulting from a violation of the federal anti-kickback statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act. False claims laws prohibit anyone from knowingly presenting, or causing to be presented for payment, to government third-party payors (including Medicare and Medicaid) claims for reimbursed drugs, or biologics or services that are false or fraudulent, claims for items or services not provided as claimed, or claims for medically unnecessary items or services. Liability may also arise from false certification of compliance with laws and regulations that are conditions of payment. Our activities relating to the sale and marketing of our products may be subject to scrutiny under these laws. Violations of fraud and abuse laws, and other healthcare statutes are punishable by criminal and civil sanctions, including fines and civil monetary penalties, the possibility of exclusion from federal healthcare programs (including Medicare and Medicaid) and corporate integrity agreements, which impose, among other things, rigorous operational and monitoring requirements on companies. We may further be subject to such other actions as debarment from government contracts and future orders under existing contracts, refusal to allow us to enter into supply contracts, including government contracts, reputational harm, diminished profits and future earnings and the curtailment or restructuring of our operations, any of which could adversely affect our business.

Given the significant penalties and fines that can be imposed on companies and individuals if convicted or found liable, allegations of violations under fraud and abuse laws often result in settlements even if the company or individual being investigated admits no wrongdoing. Settlements often include significant civil sanctions, including fines and civil monetary penalties, and corporate integrity agreements. If the government were to allege or convict us or our executive officers of violating these laws, our business and ability to consummate any strategic transaction, could be harmed. In addition, private individuals have the ability to bring similar actions under the False Claims Act. Our activities could be subject to challenge for the reasons discussed above and due to the broad scope of these laws and the increasing attention being given to them by law enforcement authorities. Further, an increasing number of state laws require manufacturers to make reports to states on pricing and marketing information. Many of these laws contain ambiguities as to what is required to comply with the laws. Given the lack of clarity in laws and their implementation, our reporting actions could be subject to the penalty provisions of the pertinent state authorities.

Similar rigid restrictions are imposed on the promotion and marketing of medicinal products in the European Union and other countries. Laws (including those governing promotion, marketing and anti-kickback provisions), industry regulations and professional codes of conduct often are strictly enforced. Even in those countries where we are not directly responsible for the promotion and marketing of our products, inappropriate activity by our international distribution partners can have adverse implications for us.

Risks Related to Our Intellectual Property

If our efforts to protect our intellectual property related to vonapanitase or any additional product candidates are not adequate, we may not be able to compete effectively in our market or consummate any strategic transaction on terms that enhance stockholder value.

We rely upon a combination of patents, patent applications, know-how and confidentiality agreements to protect the intellectual property related to our only product candidate, vonapanitase, and will use a similar strategy to protect any additional product candidates. The patent position of biotechnology companies is generally uncertain because it involves complex legal and factual considerations. The standards applied by the United States Patent and Trademark Office, or USPTO, and foreign patent offices in granting patents are not always applied uniformly or predictably. For example, there is no uniform worldwide policy regarding patentable subject matter or the scope of claims allowable in biotechnology patents. The patent applications that we own may fail to result in issued patents with claims that cover vonapanitase or any additional product candidates in the United States or in other countries. There is no assurance that all potentially relevant prior art relating to our patents and patent applications has been found, and prior art that is not before the patent examiners, as well as prior art that is before the patent examiners, could be used by a third party to invalidate a patent or could be relied on to prevent a patent from issuing from a pending patent application. Even if patents do successfully issue and even if these patents cover vonapanitase or any additional product candidates, third parties may challenge their validity, enforceability or scope, which may result in our patents being narrowed or invalidated.

Furthermore, even if they are unchallenged, our patents and patent applications may not adequately provide exclusivity for vonapanitase or any additional product candidates, prevent others from designing around our patents with similar products that are outside the scope of our patents, or prevent others from operating in jurisdictions in which we did not pursue patent protection. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

If patent applications we hold with respect to vonapanitase or any additional product candidates fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for vonapanitase or any additional product candidates, it could dissuade companies from collaborating with us, including in any strategic transaction, or from valuing our intellectual property in a manner that enhances stockholder value in any potential strategic transaction. As of March 31, 2019 we own 42 issued patents and own 14 pending patent applications, most of which cover aspects of vonapanitase or its use. We cannot offer any assurances about which, if any, of the pending patent applications will issue as patents, the breadth of any such patents or any of our currently issued patents, or whether any issued patents will be challenged by third parties or will be found invalid and unenforceable if challenged. Any successful challenge to these patent applications, or patents that may issue from them, or to currently issued patents owned by us, could deprive us of rights necessary for the successful commercialization of vonapanitase or any other product candidate that we may develop. Since patent applications in the United States and most other countries are confidential for a period of time after filing, and some remain so until issued, we cannot be certain that we were the first to file a patent application relating to any particular aspect of a product candidate. Furthermore, if third parties have filed such patent applications, an interference proceeding in the United States can be initiated by these third parties, or by the USPTO itself, to determine who was the first to invent any of the subject matter covered by the patent claims of our patents and patent applications.

In the United States, for patent applications filed prior to March 16, 2013, assuming the other requirements for patentability are met, the first to invent is entitled to the patent, while outside the United States, the first to file a patent application is entitled to the patent. Certain of our currently pending utility patent applications are examined under the system in place before March 16, 2013. Third parties are allowed to submit prior art prior to the issuance of a patent by the USPTO, and may become involved in reexamination, *inter partes* review or interference proceedings challenging our patent rights. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, which could adversely affect our competitive position with respect to third parties.

In addition, patents have a limited lifespan. In most countries, the statutory term of a patent is 20 years from the earliest domestic priority date claimed. In the United States, for applications filed after June 7, 1995, the statutory term of a patent is 20 years from earliest non-provisional priority date claimed. Various extensions of patent protection may be available in particular countries; however, in all circumstances, the life of a patent, and the protection it affords, has a limited term. If we encounter delays in obtaining regulatory approvals, the period of time during which we could market a product under patent protection could be reduced. We expect to seek extensions of patent protection where these are available in any countries where we are prosecuting patents. Such possible extensions include those permitted under the Drug Price Competition and Patent Term Restoration Act of 1984 in the United States, which permits up to five years' extension of patent protection and no more than fourteen years following product approval for a single patent that covers an FDA-approved drug or biologic that contains an active ingredient or salt or ester of the active ingredient that has not previously been marketed. The scope of protection available during an extension of a patent claiming a product is limited to the approved product itself for approved uses, and the scope of protection available during an extension of a patent claiming a method of using a product is limited to the uses claimed in the patent and approved for the product. The actual length of the extension is calculated by adding one half of the time between the IND effective date and a company's initial submission of a marketing application, plus the entire time between the submission of the marketing application and the FDA's approval of the application. However, the applicable authorities, including the FDA and the USPTO in the United States, and any equivalent regulatory authority in other countries, may not agree with our assessment of whether such extensions are available, and may refuse to grant extensions to our patents, or may grant more limited extensions than we request. If this occurs, our competitors may be able to take advantage of our investment in development and clinical trials by referencing our clinical and preclinical data, and then may be able to launch their product earlier than might otherwise be the case.

Any loss of, or failure to obtain, patent protection could have a material adverse impact on our business and our ability to consummate any strategic transaction, including our ability to consummate a strategic transaction that enhances stockholder value. We may be unable to prevent competitors from entering the market with a product that is similar to or the same as our products.

Confidentiality agreements with employees and third parties may not prevent unauthorized disclosure of proprietary information.

We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our data and know-how by maintaining physical security of our premises and physical and electronic security of our information technology systems. Nonetheless, despite these precautions, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our know-how may otherwise become known or be independently discovered by competitors. To the extent that our consultants, contractors or collaborators use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Enforcing a claim that a third party illegally obtained and is using any of our know-how is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States sometimes are less willing than United States courts to protect know-how. Misappropriation or unauthorized disclosure of our know-how could impair our competitive position and may have a material adverse effect on our business.

We may become involved in lawsuits to protect or enforce our intellectual property, which could be expensive, time consuming and unsuccessful, and which may lead to a finding that our patents are invalid and/or unenforceable.

Competitors may infringe our patents or misappropriate or otherwise violate our intellectual property rights. To counter infringement or unauthorized use, litigation may be necessary to enforce or defend our intellectual property rights, to protect our know-how and/or to determine the validity and scope of our own intellectual property rights. Intellectual property litigation can be expensive and time consuming. Many of our current and potential competitors have the ability to dedicate substantially greater resources to litigate intellectual property rights than we can. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing or misappropriating our intellectual property. Litigation could result in substantial costs and diversion of management resources, which could harm our business and financial results. In addition, in an infringement proceeding, a court may decide that our patents are invalid or unenforceable, and may refuse to stop the other party from using the technology at issue, including on the grounds that our patents are invalid or unenforceable or do not cover the technology in question. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated, held unenforceable or interpreted narrowly. 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 this type of litigation.

If we are unable to adequately protect our proprietary technology, or obtain and maintain issued patents which are sufficient to protect our current product candidate, vonapanitase, or any additional product candidates, others could compete against us more directly, which would have a material adverse impact on our business, financial condition and ability to consummate a strategic transaction.

We strive to protect and enhance the proprietary technologies that we believe are important to our business, including seeking patents intended to cover our products and compositions, their methods of use and any other inventions that are important to the development of our business. We also rely on know-how to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection.

Our ability to successfully implement our business strategies, including the potential consummation of a strategic transaction will depend significantly on our ability to obtain and maintain patent and other proprietary protection for commercially important technology, inventions and know-how related to our business, defend and enforce our current patents and any future patents that may issue, preserve the confidentiality of our know-how and operate without infringing the valid and enforceable patents and proprietary rights of third parties. We also rely on know-how and in-licensing opportunities to develop, strengthen and maintain the proprietary position of vonapanitase or any additional product candidates.

We cannot provide any assurances that any of our pending patent applications will mature into issued patents and, if they do, that such patents or our currently issued patents will include claims with a scope sufficient to protect vonapanitase or any additional product candidates or otherwise provide any competitive advantage. For example, one of our patents that may provide coverage for vonapanitase only covers particular formulations. As a result, this patent would not prevent third-party competitors from creating, making and marketing alternative formulations that fall outside the scope of our patent claims. There can be no assurance that any such alternative formulations will not be equally effective.

Moreover, other parties have developed technologies that may be related or competitive to our approach, and may have filed or may file patent applications and may have received or may receive patents that may overlap or conflict with our patent applications, either by claiming the same methods or formulations or by claiming subject matter that could dominate our patent position. These third party patent positions may limit or even eliminate our ability to obtain patent protection for certain inventions.

The patent positions of biotechnology and pharmaceutical companies, including our patent position, involve complex legal and factual questions, and, therefore, the issuance, scope, validity and enforceability of any patent claims that we may obtain cannot be predicted with certainty. Patents, if issued, may be challenged, deemed unenforceable, invalidated, or circumvented. United States patents and patent applications may also be subject to interference proceedings, *ex parte* reexamination, or *inter partes* review proceedings, and challenges in district court. Patents may be subjected to opposition, revocation proceedings, or comparable proceedings lodged in various foreign, both national and regional, patent offices. These proceedings could result in either loss of the patent or denial of the patent application or loss or reduction in the scope of one or more of the claims of the patent or patent application. In addition, such proceedings may be costly. Thus, any patents that we may own or exclusively license may not provide any protection against competitors. Furthermore, an adverse decision in an interference proceeding can result in a third party receiving the patent right sought by us, which in turn could affect our ability to develop, market or otherwise commercialize vonapanitase or any additional product candidates.

Furthermore, though a patent is presumed valid and enforceable, its issuance is not conclusive as to its validity or its enforceability and it may not provide us with adequate proprietary protection or competitive advantages against competitors with similar products. Even if a patent issues and is held to be valid and enforceable, competitors may be able to design around our patents, such as using pre-existing or newly developed technology. Other parties may develop and obtain patent protection for more effective technologies, designs or methods. We may not be able to prevent the unauthorized disclosure or use of our technical knowledge or know-how by consultants, vendors, former employees and current employees. The laws of some foreign countries do not protect our proprietary rights to the same extent as the laws of the United States, and we may encounter significant problems in protecting our proprietary rights in these countries. If these developments were to occur, they could have a material adverse effect on our sales.

In addition, proceedings to enforce or defend our patents, if and when issued, could put our patents at risk of being invalidated, held unenforceable, or interpreted narrowly. These proceedings could also provoke third parties to assert claims against us, including that some or all of the claims in one or more of our patents are invalid or otherwise unenforceable. If any of our patents, if and when issued, covering vonapanitase or any additional product candidates, are invalidated or found unenforceable, our financial position and results of operations would be materially and adversely impacted. In addition, if a court found that valid, enforceable patents held by third parties covered vonapanitase, or any additional product candidates, our financial position and results of operations would also be materially and adversely impacted.

The degree of future protection for our proprietary rights is uncertain, and we cannot ensure that:

- any of our patents or pending patent applications, if issued, will include claims having a scope sufficient to protect vonapanitase or any additional product candidates;
- any of our pending patent applications will issue as patents at all;
- we will be able to successfully commercialize product candidates, if approved, before our relevant patents expire;
- we were the first to make the inventions covered by each of our patents and pending patent applications;
- we were the first to file patent applications for these inventions;
- others will not develop similar or alternative technologies that do not infringe our patents;
- others will not use pre-existing technology to effectively compete against us;
- any of our patents will be found ultimately to be valid and enforceable;
- any patents issued to us will provide a basis for an exclusive market for our commercially viable products, will provide us with any competitive advantages or will not be challenged by third parties;
- we will develop additional proprietary technologies or product candidates that are separately patentable; or
- that our commercial activities or products will not infringe the patents or proprietary rights of others.

We rely upon unpatented know-how to maintain our competitive position, which we seek to protect, in part, by confidentiality agreements with our employees and our collaborators and consultants. It is possible that technology relevant to our business will be independently developed by a person that is not a party to such an agreement. Furthermore, if the employees and consultants who are parties to these agreements breach or violate the terms of these agreements, we may not have adequate remedies for any such breach or violation, and our confidential know-how could become known to others through such breaches or violations. Further, our know-how could otherwise become known or be independently discovered by our competitors. Further, the term of confidentiality requirements for current and terminated agreements with some of our consultants, contract manufacturing or research organizations and other third parties is finite.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We enter into confidentiality and intellectual property assignment agreements with our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors. These agreements generally provide that inventions conceived by the party in the course of rendering services to us will be our exclusive property. However, these agreements may not be honored and may not effectively assign intellectual property rights to us. For example, even if we have a consulting agreement in place with an academic advisor pursuant to which the academic advisor is required to assign any inventions developed in connection with providing services to us, the academic advisor may not have the right to assign these inventions to us, as it may conflict with his or her obligations to assign all intellectual property to his or her employing institution.

Litigation may be necessary to defend against these and other claims challenging inventorship or ownership of inventions. If we are unsuccessful in defending against any of these claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case.

Issued patents covering vonapanitase or covering any additional product candidates could be found invalid or unenforceable if challenged in court.

If we initiated legal proceedings against a third party to enforce a patent, if and when issued, covering vonapanitase or any additional product candidate, the defendant could counterclaim that the patent covering our product candidate is invalid and/or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include alleged failures to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for unenforceability assertions include allegations that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. These mechanisms include reexamination and *inter partes* review in the United States and equivalent proceedings in foreign jurisdictions, *e.g.*, opposition proceedings. These proceedings could result in revocation or amendment of our patents in such a way that they no longer cover, for example, vonapanitase or competitive products. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to validity, for example, we cannot be certain that there is no invalidating prior art, including prior art of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on the applicable product candidate. A loss of patent protection would have a material adverse impact on our business.

We will not seek to protect our intellectual property rights in all jurisdictions throughout the world, and we may not be able to adequately enforce our intellectual property rights even in the jurisdictions where we seek protection.

Filing, prosecuting and defending patents on product candidates in all countries and jurisdictions throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States could be less extensive than those in the United States, assuming that rights are obtained in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions.

Competitors may use our technologies in jurisdictions where we do not pursue and obtain patent protection to develop their own products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Even if we pursue and obtain issued patents in particular jurisdictions, our patent claims or other intellectual property rights may not be effective or sufficient to prevent third parties from so competing.

The laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States. Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. The legal systems of some countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, especially those relating to biotechnology. This could make it difficult for us to stop the infringement of our patents, if obtained, or the misappropriation of our other intellectual property rights. For example, many foreign countries have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, many countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. Patent protection must ultimately be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biopharmaceuticals, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly, could put our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Some of our intellectual property may have been discovered through government funded programs and thus may be subject to federal regulations such as government "march-in" rights, certain reporting requirements, and a preference for United States industry. Compliance with these regulations may limit our exclusive rights, subject us to expenditure of resources with respect to reporting requirements, and limit our ability to contract with foreign manufacturers.

Some of our intellectual property rights may have been generated through the use of United States government funding and therefore are subject to certain federal regulations. For example, our patents relating to some therapeutic uses of vonapanitase and associated systems and kits that include a catheter, which we refer to as the "therapy family," arose from research funded by the United States government. As a result, the United States government has certain rights to this intellectual property pursuant to the Bayh-Dole Act of 1980, or Bayh-Dole Act. These United States government rights in certain inventions developed under a government-funded program include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the United States government has the right to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations, also referred to as "march-in rights." The United States government also has the right to take title to these inventions if we, or the applicable licensor, fail to disclose the invention to the government and fail to file an application to register the intellectual property within specified time limits. In addition, the United States government may acquire title to these inventions in any country in which a patent application is not filed within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us or the applicable licensor to expend substantial resources. In addition, the United States government requires that any products embodying the subject invention or produced through the use of the subject invention be manufactured substantially in the United States. The manufacturing preference requirement can be waived if the owner of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for United States manufacturers may limit our ability to contract with foreign product manufacturers for products covered by the applicable intellectual property.

We currently do not plan to apply for additional United States government funding, but if we do, and we discover compounds or drug or biological candidates as a result of such funding, intellectual property rights to these discoveries may be subject to the applicable provisions of the Bayh-Dole Act.

If we do not obtain additional protection under the Hatch-Waxman Amendments and similar foreign legislation by extending the patent protection for vonapanitase, our business may be materially harmed.

Depending upon the timing, duration and specifics of the first FDA marketing approval of vonapanitase and, if applicable, any additional product candidates, a United States patent that we own or license may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit extension of one patent that covers an FDA-approved drug or biologic that contains an active ingredient or salt or ester of the active ingredient that has not previously been marketed for up to five years and no more than fourteen years after product approval for patent term lost during product development and the FDA regulatory review process. The length of the extension is calculated by adding one half of the time between the IND effective date and a company's initial submission of a marketing application, plus the entire time between the submission of the marketing application and the FDA's approval of the application. During this period of extension, the scope of protection is limited to the approved product for approved uses (for patents claiming a product) and any use claimed by the patent and approved for the product (for patents claiming a method of using a product).

Although we plan on seeking patent term restoration for our products, it may not be granted if, for example, we fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term restoration or the term of any such patent restoration is less than we request, our competitors may be able to enter the market and compete against us sooner than we anticipate, and our ability to generate revenues could be materially adversely affected.

Changes in United States patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other biotechnology companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biotechnology industry involve both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the United States has in recent years implemented wide-ranging patent reform legislation, the Leahy-Smith America Invents Act, or America Invents Act. The America Invents Act includes a number of significant changes to United States patent law. These include provisions that affect the way patent applications will be prosecuted, provides expanded opportunities for post-grant administrative review of patents before the USPTO, and may also affect patent litigation. The USPTO developed new regulations and procedures to govern administration of the America Invents Act, and many of the substantive changes to patent law associated with the America Invents Act, in particular the first to file provisions, only became effective on March 16, 2013. A third party that files a patent application in the USPTO after that date but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by the third party. This requires us to be cognizant of the time from invention to filing of a patent application. Thus, for our U.S. patent applications containing a priority claim after March 16, 2013, there is a greater level of uncertainty in the patent law. Moreover, some of the patent applications in our portfolio will be subject to examination under the pre-America Invents Act law and regulations, while other patents applications in our portfolio will be subject to examination under the law and regulations, as amended by the America Invents Act. This introduces additional complexities and costs into the prosecution and management of our portfolio.

In addition, the America Invents Act and recent Supreme Court and U.S. Court of Appeals for the Federal Circuit decisions limit where a patentee may file a patent infringement suit, and the America Invents Act provides opportunities for third parties to challenge any issued patent in the USPTO. These provisions apply to all of our U.S. patents, even those filed before March 16, 2013. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in U.S. federal court necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a federal court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims because it may be easier for them to do so relative to challenging the patent in a federal court action. It is not clear what, if any, impact the America Invents Act will have on the operation of our business. However, the America Invents Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of any patents that may issue from our patent applications, all of which could have a material adverse effect on our business and financial condition.

In addition, recent United States Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. The full impact of these decisions is not yet known. For example, on March 20, 2012 in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, the Court held that several claims drawn to measuring drug metabolite levels from patient samples and correlating them to drug doses were not patent-eligible subject matter. The decision appears to impact diagnostics patents that merely apply a law of nature via a series of routine steps and it has created uncertainty around the ability to obtain patent protection for certain inventions. Additionally, on June 13, 2013 in *Association for Molecular Pathology v. Myriad Genetics, Inc.,* the Court held that claims to isolated genomic DNA are not patent-eligible, but claims to complementary DNA molecules are patent-eligible because they are not a natural product. The effect of the decision on patents for other isolated natural products is uncertain. On June 19, 2014 in *Alice Corporation Pty. Ltd. v. CLS Bank International, et al.,* a case involving patent claims directed to a method for mitigating settlement risk, the Court held that the patent eligibility of claims directed to abstract ideas, products of nature, and laws of nature should be determined using the same framework set forth in Prometheus. The USPTO has issued a series of guidelines setting forth procedures for determining subject matter eligibility of claims directed to abstract ideas, products of nature, and laws of nature in line with the *Prometheus, Myriad and Alice* decisions. This guidance does not limit the application of *Myriad* to DNA, but, rather, applies the decision to other natural products. The USPTO's interpretation of the case law and new guidelines for examination may influence, possibly adversely, prosecution and defense of certain types of claims in our portfolio.

In addition to increasing uncertainty with regard to our ability to obtain future patents, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on these and other decisions by the United States Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our current or future patents.

We may be subject to damages resulting from claims that we or our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

Our employees have been previously employed at other biotechnology or pharmaceutical companies, including our competitors or potential competitors, or at universities or academic medical centers. We also engage advisors and consultants who are concurrently employed at universities or who perform services for other entities. Although we are not aware of any claims currently pending against us, we may be subject to claims that we or our employees, advisors or consultants have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of a former employer or other third party. We may in the future also be subject to claims that an employee, advisor or consultant performed work for us that conflicts with that person's obligations to a third party, such as an employer, and thus, that the third party has an ownership interest in the intellectual property arising out of work performed for us. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management. If we are unsuccessful in defending against such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. A loss of key personnel or their work product could hamper or prevent our ability to commercialize vonapanitase or any additional product candidates, which would materially adversely affect our commercial development efforts.

Numerous factors may limit any potential competitive advantage provided by our intellectual property rights.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business, provide a barrier to entry against our competitors or potential competitors, or permit us to maintain our competitive advantage. Moreover, if a third party has intellectual property rights that cover the practice of our technology, we may not be able to exercise or extract value from our intellectual property rights fully or at all. The following examples are illustrative:

- we might not have been the first to make the inventions covered by a patent or pending patent application that we own;
- we might not have been the first to file patent applications covering an invention;
- others may independently develop similar or alternative technologies without infringing our intellectual property rights;
- third parties may compete with us in jurisdictions where we do not pursue and obtain patent protection;
- pending patent applications that we own may not lead to issued patents;
- patents that we own may not provide us with any competitive advantages, or may be held invalid or unenforceable;
- third parties may assert an ownership interest in our intellectual property;
- we may not develop or in-license additional proprietary technologies that are patentable; and
- the patents or proprietary rights of others may have an adverse effect on our business.

Should any of these events occur, they could significantly harm our business and results of operations.

Risks Related to Our Business and Industry

If product liability lawsuits are successfully brought against us, our insurance may be inadequate and we may incur substantial liability.

We face an inherent risk of product liability claims as a result of the clinical testing of vonapanitase or any additional product candidates. We will face an even greater risk if we commercially sell vonapanitase or any additional product candidate that we develop. We maintain primary product liability insurance and excess product liability insurance that cover our clinical trials, and we plan to maintain insurance against product liability lawsuits for commercial sale of our potential products. Historically, the potential liability associated with product liability lawsuits for pharmaceutical products has been unpredictable. Although we believe that our current insurance is a reasonable estimate of our potential liability and represents a commercially reasonable balancing of the level of coverage as compared to the cost of the insurance, we may be subject to claims in connection with our clinical trials and, in the future, commercial use of our potential products, for which our insurance coverage may not be adequate, and the cost of any product liability litigation or other proceeding, even if resolved in our favor, could be substantial.

For example, we may be sued if any product we develop allegedly causes injury or is found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Large judgments have been awarded in class action lawsuits based on drugs or biologics that had unanticipated adverse effects. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of vonapanitase or any additional product candidates. Regardless of the merits or eventual outcome, liability claims may result in:

- reduced resources of our management to pursue our business strategy;
- 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;
- termination of clinical trial sites or entire trial programs;
- initiation of investigations by regulators;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- significant costs to defend resulting litigation;
- diversion of management and scientific resources from our business operations;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize any products that we may develop.

We currently have a $5 million product liability insurance coverage in connection with our clinical trials and we will need to increase our insurance coverage if and when we begin selling vonapanitase or any additional product candidates if and when they receive marketing approval. However, the product liability insurance we will need to obtain in connection with the commercial sales of vonapanitase or any additional product candidates if and when they receive regulatory approval may be unavailable in meaningful amounts or at a reasonable cost. 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 vonapanitase or any additional product candidates if and when they obtain regulatory approval, which could materially adversely affect our business, financial condition, results of operations, cash flows and prospects.

Additionally, we do not carry insurance for all categories of risk that our business may encounter. Some of the policies we currently maintain include general liability, employment practices liability, property, auto, workers' compensation, products liability and directors' and officers' insurance. We do not know, however, if we will be able to maintain insurance with adequate levels of coverage. Any significant uninsured liability may require us to pay substantial amounts, which would materially adversely affect our financial position, cash flows and results of operations.

We currently have our API produced for us by a contract manufacturer exclusively in one manufacturing facility and if this or any future facility, any facility we use for storage of the finished product or our equipment were damaged or destroyed, our ability to continue to operate our business would be materially harmed.

Our executive offices are located in Waltham, Massachusetts, and our API is manufactured at Lonza's facility located in Visp, Switzerland. We completed three drug substance process validation runs at Lonza's facility in Visp, Switzerland and currently store such material in only one location. We are vulnerable to natural disasters, such as severe storms and other events that could disrupt our operations. We do not carry insurance for natural disasters and we may not carry sufficient business interruption insurance to compensate us for losses that may occur. If the current manufacturing facility or any future facility, stored product or equipment were damaged or destroyed, or if we experience a significant disruption in our operations for any reason, our ability to continue to operate our business would be materially harmed.

Our business and operations would suffer in the event of system failures or security breaches.

Despite the implementation of security measures, our internal computer systems, and those of our CROs and other third parties on which we rely, are vulnerable to damage from computer viruses, unauthorized access, cyber attacks, natural disasters, terrorism, war and telecommunication and electrical failures. If issues were to arise and cause interruptions in our operations, it could result in a material disruption of our drug and biologic development programs or could cause loss of critical data or the unauthorized disclosure, access, acquisition, alteration, or use of personal or other confidential information. For example, the loss of clinical trial data from completed or planned clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development of vonapanitase or any additional product candidates could be delayed. We may also be vulnerable to cyber attacks by hackers, or other malfeasance. This type of breach of our cybersecurity may compromise our confidential information and/or our financial information and detrimentally impact our business or result in significant legal and financial exposure and/or reputational harm.

In addition, while we select third-party vendors and business partners carefully and routinely evaluate the cybersecurity of our CROs and other key vendors, we do not control their actions. Any problems caused by these third parties, including those resulting from cyber attacks and security breaches at a vendor, could result in material delays in our development programs and regulatory approval efforts and adversely affect our business. Moreover, data security incidents 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.

There are also numerous federal, state, and local laws and regulations in the United States and around the world regarding privacy and the collection, processing, storing, sharing, disclosing, using, cross-border transfer, and protecting of personal information and other data, the scope of which are changing, subject to differing interpretations, and which may be costly to comply with, may result in regulatory fines or penalties, and may be inconsistent between countries and jurisdictions or conflict with other requirements. We strive to comply with all applicable laws, policies, legal obligations, and industry codes of conduct relating to privacy and data protection, to the extent possible. However, it is possible that these obligations may be interpreted and applied in new ways or in a manner that is inconsistent from one jurisdiction to another and may conflict with other rules or our practices or that new regulations could be enacted. Several proposals are pending before federal, state, and foreign legislative and regulatory bodies that could affect our business. Any failure or perceived failure by us to comply with our privacy-related obligations to third parties, or our privacy-related legal obligations, or any compromise of security that results in the unauthorized release or transfer of sensitive information, which could include personally identifiable information or other user data, may result in governmental investigations, enforcement actions, regulatory fines, litigation, or public statements against us by advocacy groups or others, and could cause third parties, including clinical sites, regulators or potential partners, to lose trust in us, which could have an adverse effect on our business.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading, which could significantly harm our business.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with the regulations of the FDA and foreign regulators, provide accurate information to the FDA and foreign regulators, comply with healthcare fraud and abuse laws and regulations in the United States and abroad, and report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. We have a Code of Business Conduct and Ethics, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. If any actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of significant fines or other sanctions.

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

Our management has broad discretion to use our cash and cash equivalents to fund our operations and could spend these funds in ways that do not improve our results of operations or enhance the value of our Common Stock. The failure of 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 to fund our operations, we may invest our cash and cash equivalents in a manner that does not produce income or that loses value.

Risks Related to Our Common Stock

Our stock price is volatile and our stockholders may not be able to resell shares of our common stock at or above the price they paid.

The trading price of our common stock is highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. These factors include those discussed in this "Risk Factors" section of this report and others such as:

- announcement of a strategic transaction, including the acquisition of our company or its assets;
- announcements relating to collaborations that we may enter into with respect to the development or commercialization of our vonapanitase;
- our failure to develop and commercialize vonapanitase or any additional product candidates;
- actual or anticipated fluctuations in our quarterly financial results or the quarterly financial results of companies perceived to be similar to us;
- changes in the market's expectations about our operating results;
- adverse results or delays in preclinical studies or clinical trials;
- success of competitive products;
- adverse developments concerning our collaborations and our manufacturers;
- operating and stock price performance of other companies that investors deem comparable to us;
- overall performance of the equity markets;

- announcements by us or our competitors of acquisitions, new product candidates or programs, significant contracts, commercial relationships or capital commitments;
- product liability claims related to our clinical trials or product candidates;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for vonapanitase or any additional product candidates;
- commencement of, or involvement in, litigation involving our company, our general industry, or both;
- changes in our capital structure, such as future issuances of securities or the incurrence of additional debt;
- the volume of shares of our Common Stock available for public sale;
- additions or departures of key scientific or management personnel;
- changes in laws and regulations affecting our business, including but not limited to clinical trial requirements for approvals;
- any major change in our board or management;
- changes in accounting practices;
- ineffectiveness of our internal control over financial reporting;
- sales of substantial amounts of Common Stock by our directors, executive officers or significant stockholders or the perception that such sales could occur; and
- general economic and political conditions such as recessions, interest rates, fuel prices, international currency fluctuations and acts of war or terrorism.

Broad market and industry factors may materially harm the market price of our Common Stock irrespective of our operating performance. The stock market in general, and NASDAQ and the market for biotechnology companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of the particular companies affected. The trading prices and valuations of these stocks, and of ours, may not be predictable. A loss of investor confidence in the market for technology or software stocks or the stocks of other companies which investors perceive to be similar to us, the opportunities in the digital simulation market or the stock market in general, could depress our stock price regardless of our business, prospects, financial conditions or results of operations.

Our common stock is listed on NASDAQ under the symbol "PRTO". To continue to be listed on Nasdaq, we are required to satisfy a number of conditions. We may not satisfy NASDAQ's other requirements for continued listing. If we cannot satisfy these requirements, Nasdaq could delist our common stock and could limit our strategic alternatives and ability to consummate a potential transaction.

We cannot assure you that we will be able to satisfy the Nasdaq listing requirements in the future. If we are delisted from Nasdaq, trading in our shares of common stock may be conducted, if available, on the "OTC Bulletin Board Service" or, if available, via another market. In the event of such delisting, an investor would likely find it significantly more difficult to dispose of, or to obtain accurate quotations as to the value of the shares of our common stock, and our ability to raise future capital through the sale of the shares of our common stock or other securities convertible into or exercisable for our common stock could be severely limited. A determination could also then be made that our common stock is a "penny stock" which would require brokers trading in our common stock to adhere to more stringent rules and possibly result in a reduced level of trading. This could have a long-term impact on our ability to raise future capital through the sale of our common stock.

Our common stock may be delisted from the NASDAQ Global Market if we are unable to maintain compliance with NASDAQ's continued listing standards.

NASDAQ imposes, among other requirements, continued listing standards including minimum bid and public float requirements. The price of our common stock must trade at or above $1.00 to comply with NASDAQ's minimum bid requirement for continued listing on the NASDAQ Global Market. If our stock trades at bid prices of less than $1.00 for a period in excess of 30 consecutive business days, NASDAQ could send a deficiency notice to us for not remaining in compliance with the minimum bid listing standards. Our common stock has traded below $1.00 since our announcement of the PATENCY-2 top-line results on March 28, 2019.

Additionally, the market value of our listed securities must be at or above $50,000,000 for continued listing on the NASDAQ. If the market value of our listed securities is less than $50,000,000 for 30 consecutive business days, NASDAQ could send a deficiency notice to us for not remaining in compliance the market value standard. The market value of our listed securities has been below $50,000,000 since our announcement of the PATENCY-2 top-line results on March 28, 2019.

If the closing bid price of our common stock continues to fail to meet NASDAQ's minimum closing bid price requirement, if the market value of our listed securities continues to fail to meet NASDAQ's minimum market value standard, or if we otherwise fail to meet any other applicable requirements of NASDAQ and we are unable to regain compliance, NASDAQ may make a determination to delist our common stock.

Any delisting of our common stock could adversely affect the market liquidity of our common stock and the market price of our common stock could decrease. Furthermore, if our common stock were delisted it could adversely affect our ability to complete one or more strategic transactions for the company, to obtain financing for the continuation of our operations and/or result in the loss of confidence by investors, customers, suppliers and employees.

We are an "emerging growth company" and as a result of the reduced disclosure and governance requirements applicable to emerging growth companies, our Common Stock may be less attractive to investors.

We are an "emerging growth company," or EGC, as defined in the JOBS Act, and we intend to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not EGCs, including: not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may take advantage of these reporting exemptions until we are no longer an EGC. We will remain an EGC until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of our IPO, (b) in which we have total annual gross revenue of at least $1.07 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our Common Stock that is held by non-affiliates exceeds $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1 billion in non-convertible debt during the prior three-year period.

We cannot predict whether investors will find our Common Stock less attractive if we rely on these exemptions. If some investors find our Common Stock less attractive as a result, there may be a less active trading market for our Common Stock and our stock price may be more volatile. In addition, the JOBS Act provides that an EGC can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an EGC to delay the adoption of these accounting standards until they would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not EGCs.

Even after we no longer qualify as an EGC, we may still qualify as a "smaller reporting company" which would allow us to take advantage of many of the same exemptions from disclosure requirements, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements. We cannot predict if investors will find our Common Stock less attractive because we will 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.

Actual or potential sales of our Common Stock by our employees, including our executive officers, pursuant to pre-arranged stock trading plans could cause our stock price to fall or prevent it from increasing for numerous reasons, and actual or potential sales by such persons could be viewed negatively by other investors.

In accordance with the guidelines specified under Rule 10b5-1 of the Exchange Act and our policies regarding stock transactions, a number of our employees, including executive officers, have adopted and may continue to adopt stock trading plans pursuant to which they have arranged to sell shares of our Common Stock from time to time in the future. Generally, sales under such plans by our executive officers and directors require public filings. Actual or potential sales of our Common Stock by such persons could cause the price of our Common Stock to fall or prevent it from increasing for numerous reasons. For example, a substantial number of shares of our Common Stock becoming available (or being perceived to become available) for sale in the public market could cause the market price of our Common Stock to fall or prevent it from increasing. Also, actual or potential sales by such persons could be viewed negatively by other investors.

The resale of the shares of Common Stock issuable upon the conversion of our Series A Convertible Preferred Stock could adversely affect the prevailing market price of our Common Stock and cause stockholders to experience dilution.

On August 2, 2017, we issued and sold 22,000 shares of our Series A Convertible Preferred Stock, par value $0.001 per share, for a purchase price of $1,000 per share, or an aggregate purchase price of $22.0 million. Each share of Series A Convertible Preferred Stock is convertible into approximately 1,005 shares of our Common Stock at a conversion price of $0.9949 per share, provided that any conversion of Series A Convertible Preferred Stock by a holder into shares of Common Stock is prohibited if, as a result of such conversion, the holder, together with its affiliates and any other person or entity whose beneficial ownership of our Common Stock would be aggregated with such holder's for purposes of Section 13(d) of the Exchange Act, would beneficially own more than 9.985% of the total number of shares of our Common Stock issued and outstanding after giving effect to such conversion (the "Blocker"). Pursuant to the registration statement that we filed with the SEC for the resale by holders of our Series A Preferred Convertible Stock, as selling stockholders, of the aggregate 22,112,775 shares of Common Stock that are issuable upon conversion of the Series A Convertible Preferred Stock, the outstanding shares of Series A Convertible Preferred Stock may, at each holder's election, be converted into our Common Stock, subject to the Blocker. As of March 2019, 340 shares of our Series A Convertible Preferred Stock were converted into Common Stock. Although we cannot predict if and when the holders of Series A Convertible Preferred Stock may sell such shares in the public market, any converted shares of Common Stock will be available for immediate resale and be able to be freely sold in the open market. The conversion of shares of Series A Convertible Preferred Stock into shares of Common Stock will result in substantial dilution to holders of our Common Stock. Further, the sale of a significant amount of these shares of Common Stock in the open market or the perception that these sales may occur could adversely affect prevailing market prices of our Common Stock, including causing the market price of our Common Stock to decline or become highly volatile.

We are highly dependent on our ability to raise additional capital and raising additional funds through debt or equity financing could be dilutive and may cause the market price of our Common Stock to decline.

We have financed our cash needs through a combination of equity offerings and debt financings, and potentially through strategic partnerships with third parties. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of those securities could result in substantial dilution for our current stockholders and the terms may include liquidation or other preferences that adversely affect the rights of our current stockholders. Furthermore, the issuance of additional securities, whether equity or debt, by us, or the possibility of such issuance, may cause the market price of our Common Stock to decline and existing stockholders may not agree with our financing plans or the terms of such financings. Moreover, the incurrence of debt financing could result in a substantial portion of our operating cash flow being dedicated to the payment of principal and interest on such indebtedness and could impose restrictions on our operations, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. Additional funding may not be available to us on acceptable terms, or at all.

If securities analysts do not publish research or reports about our business or if they downgrade our stock, the price of our Common Stock could decline.

The trading market for our Common Stock will rely in part on the research and reports that industry or financial analysts publish about us, our business, our markets and our competitors. We do not control these analysts. If securities analysts do not cover our Common Stock, the lack of research coverage may adversely affect the market price of our Common Stock. Furthermore, if one or more of the analysts who do cover us downgrade our stock or if those analysts issue other unfavorable commentary about us or our business, our stock price would likely decline. If one or more of these analysts cease coverage of us or fails to regularly publish reports on us, we could lose visibility in the market and interest in our stock could decrease, which in turn could cause our stock price or trading volume to decline and may also impair our ability to expand our business with existing customers and attract new customers.

The concentration of our capital stock ownership with insiders will likely limit your ability to influence corporate matters.

As of March 27, 2019, our executive officers, directors, current 5% or greater stockholders, and their respective affiliates together beneficially owned or controlled, in aggregate, more than 50% of the shares of our outstanding Common Stock. As a result, these executive officers, directors and principal stockholders, acting together, will have substantial influence over most matters that require approval by our stockholders, including the election of directors, any merger, consolidation or sale of all or substantially all or of our assets or any other significant corporate transaction. Corporate action might be taken even if other stockholders oppose such action. These stockholders may delay or prevent a change of control or otherwise discourage a potential acquirer from attempting to obtain control of our company, even if such change of control would benefit our other stockholders. This concentration of stock ownership may adversely affect investors' perception of our corporate governance or delay, prevent or cause a change in control of our company, any of which could adversely affect the market price of our Common Stock.

Future sales and issuances of our Common Stock or rights to purchase Common Stock, including pursuant to our equity incentive plans, could result in additional dilution of the percentage ownership of our stockholders and could cause our stock price to fall.

We have filed a registration statement permitting shares of Common Stock issued in the future, pursuant to our employee benefit plans, to be freely resold by plan participants in the public market, subject to applicable lock-up agreements, applicable vesting schedules and, for shares held by directors, executive officers and other affiliates, volume limitations under Rule 144 for shares. Our 2014 Amended and Restated Employee Incentive Plan and 2014 Employee Stock Purchase Plan also contain a provision for the annual increase of the number of shares reserved for issuance under such plan, which shares we also intend to register in the future as such annual increase occurs. If the shares we may issue from time to time under our employee benefit plans are sold, or if it is perceived that they will be sold, by the award recipient in the public market, the trading price of our Common Stock could decline.

We expect that significant additional capital will be needed in the future to continue our planned operations, including conducting clinical trials, commercialization efforts, expanded research and development activities and costs associated with operating a public company. To raise capital, we may sell Common Stock, convertible securities or other equity securities in one or more transactions, including in at-the-market offerings, at prices and in a manner we determine from time to time. If we sell Common Stock, convertible securities or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. Such sales may also result in material dilution to our existing stockholders, and new investors could gain rights, preferences and privileges senior to the holders of our Common Stock.

We will incur significant increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.

As a public company, we have incurred and will continue to incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act, and rules of the SEC and those of NASDAQ impose various requirements on public companies including requiring establishment and maintenance of effective disclosure and financial controls. Our management and other personnel devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations have increased and will continue to increase our legal and financial compliance costs and will make some activities more time-consuming and costly.

The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. In addition, we will be required to have our independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting the later of our second annual report on Form 10-K or the first annual report on Form 10-K following the date on which we are no longer an EGC. Our compliance with Section 404 of the Sarbanes-Oxley Act will require that we incur substantial accounting expense and expend significant management efforts. We currently do not have an internal audit group, and we will need to hire additional accounting and financial staff with appropriate public company experience and technical accounting knowledge. If we are not able to comply with the requirements of Section 404 in a timely manner, or if we or our independent registered public accounting firm identify deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by NASDAQ, the SEC or other regulatory authorities, which would require additional financial and management resources.

Our ability to successfully implement our business plan and comply with Section 404 requires us to be able to prepare timely and accurate financial statements. We expect that we will need to continue to improve existing, and implement new operational and financial systems, procedures and controls to manage our business effectively. Any delay in the implementation of, or disruption in the transition to, new or enhanced systems, procedures or controls, may cause our operations to suffer and we may be unable to conclude that our internal control over financial reporting is effective and to obtain an unqualified report on internal controls from our auditors as required under Section 404 of the Sarbanes-Oxley Act. This, in turn, could have an adverse impact on trading prices for our Common Stock, and could adversely affect our ability to access the capital markets.

We do not expect to pay any cash dividends for the foreseeable future.

You should not rely on an investment in our Common Stock to provide dividend income. We do not anticipate that we will pay any cash dividends to holders of our Common Stock in the foreseeable future. Instead, we plan to retain any earnings to maintain and expand our operations. Accordingly, investors must rely on sales of their Common Stock after price appreciation, which may never occur, as the only way to realize any return on their investment. As a result, investors seeking cash dividends should not purchase our Common Stock.

Our ability to use our net operating loss carryovers and certain other tax attributes may be limited.

As described above under "—Risks Related to Our Financial Condition and Need for Additional Capital," we have incurred net losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future. Under the Internal Revenue Code, as amended (the "Code"), a corporation is generally allowed a deduction for net operating losses, or NOLs, carried over from a prior taxable year. Under that provision, we can carry forward our NOLs to offset our future taxable income, if any, until such NOLs are used or expire. The same is true of other unused tax attributes, such as tax credits.

If a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period, Sections 382 and 383 of the Code, limit the corporation's ability to use carryovers of its pre-change NOLs, credits and certain other tax attributes to reduce its tax liability for periods after the ownership change. We completed a preliminary analysis to determine if there were changes in ownership for tax years through 2017, as defined by Section 382 of the Internal Revenue Code that would limit our ability to utilize certain net operating loss and tax credit carryforwards and it was preliminarily determined a change in ownership occurred in 2017. With this change in ownership, as defined by Section 382, we believe utilization of our net operating losses and tax credits carryforwards have become limited. As a result, this could result in increased U.S. federal income tax liability for us if we generate taxable income in a future period. Limitations on the use of NOLs and other tax attributes could also increase our state tax liability. The use of our tax attributes will also be limited to the extent that we do not generate positive taxable income in future tax periods.

Provisions in our amended and restated certificate of incorporation, our amended and restated bylaws and Delaware law may have anti- takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Our amended and restated certificate of incorporation, amended and restated bylaws and Delaware law contain provisions that may have the effect of delaying or preventing a change in control of us or changes in our management. Our amended and restated certificate of incorporation and bylaws include provisions that:

- authorize "blank check" preferred stock, which could be issued by our Board of Directors without stockholder approval and may contain voting, liquidation, dividend and other rights superior to our Common Stock;
- create a classified Board of Directors whose members serve staggered three-year terms;
- specify that special meetings of our stockholders can be called only by our Board of Directors;
- prohibit stockholder action by written consent;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our Board of Directors;
- provide that our directors may be removed only for cause;
- provide that vacancies on our Board of Directors may be filled only by a majority of directors then in office, even though less than a quorum;
- specify that no stockholder is permitted to cumulate votes at any election of directors;
- expressly authorize our Board of Directors to modify, alter or repeal our amended and restated bylaws; and
- require supermajority votes of the holders of our Common Stock to amend specified provisions of our amended and restated certificate of incorporation and amended and restated by laws.

These provisions, alone or together, could delay or prevent hostile takeovers and changes in control or changes in our management.

In addition, because we are incorporated in the State of Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which limits the ability of stockholders owning in excess of 15% of our outstanding voting stock to merge or combine with us.

Any provision of our amended and restated certificate of incorporation or amended and restated bylaws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our Common Stock, and could also affect the price that some investors are willing to pay for our Common Stock.

Our amended and restated certificate of incorporation designates the Court of Chancery of the State of Delaware and federal court within the State of Delaware as the exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that, subject to limited exceptions, the Court of Chancery of the State of Delaware and federal court within the State of Delaware will be exclusive forums for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, or (4) any other action asserting a claim against us that is governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our amended and restated certificate of incorporation described above. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and employees. Alternatively, if a court were to find these provisions of our amended and restated certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

Use of Proceeds from Unregistered Securities

None.

Purchase of Equity Securities

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

Item 5. Other Information

Not applicable.

Item 6. Exhibits

The exhibits filed as part of this Quarterly Report on Form 10-Q are set forth on the Exhibit Index, which Exhibit Index is incorporated herein by reference.

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.

Date: May 8, 2019

PROTEON THERAPEUTICS, INC.

By: /s/ Timothy P. Noyes
Timothy P. Noyes
President, Chief Executive Officer and Director
(Principal Executive Officer)

Date: May 8, 2019

By: /s/ George A. Eldridge
George A. Eldridge
Senior Vice President, Chief Financial Officer,
Treasurer and Secretary
(Principal Financial and Accounting Officer)

EXHIBIT INDEX

Exhibit No.		Description
31.1	*	Certification of Principal Executive Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.
31.2	*	Certification of Principal Financial Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.
32.1	**	Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101	*	Interactive Data Files Pursuant to Rule 405 of Regulation S-T: (i) the Condensed Consolidated Balance Sheets as of March 31, 2019 (unaudited) and the Consolidated Balance Sheets as of December 31, 2018; (ii) the Condensed Consolidated Statements of Operations and Comprehensive Loss (unaudited) for the three months ended March 31, 2019 and 2018; and (iii) the Condensed Consolidated Statements of Cash Flows (unaudited) for the three months ended March 31, 2019 and 2018; and (iv) the notes to the Condensed Consolidated Financial Statements (unaudited).

*Exhibits filed herewith
** Exhibits furnished herewith.

CERTIFICATION PURSUANT TO

SECURITIES EXCHANGE ACT RULES 13a-14(a) and 15d-14(a)

AS ADOPTED PURSUANT TO

SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Timothy P. Noyes, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q for the period ended March 31, 2019 of Proteon Therapeutics, 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 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 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.

/s/ Timothy P. Noyes
Timothy P. Noyes
President, Chief Executive Officer and Director
(Principal Executive Officer)

Date: May 8, 2019

CERTIFICATION PURSUANT TO

SECURITIES EXCHANGE ACT RULES 13a-14(a) and 15d-14(a)

AS ADOPTED PURSUANT TO

SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, George A. Eldridge, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q for the period ended March 31, 2019 of Proteon Therapeutics, 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 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 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.

/s/ George A. Eldridge
George A. Eldridge
Senior Vice President, Chief Financial Officer, Treasurer and Secretary
(Principal Financial Officer)

Date: May 8, 2019

CERTIFICATION PURSUANT TO SECTION 1350, AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Proteon Therapeutics, Inc. (the "Corporation") on Form 10-Q for the fiscal quarter ended March 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Timothy P. Noyes, as President and Chief Executive Officer of the Corporation, and I, George A. Eldridge, Senior Vice President, Chief Financial Officer, Treasurer and Assistant Secretary of the Corporation, 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 Corporation.

Date: May 8, 2019

By: /s/ Timothy P. Noyes
Timothy P. Noyes
President, Chief Executive Officer and Director
(Principal Executive Officer)

Date: May 8, 2019

By: /s/ George A. Eldridge
George A. Eldridge
Senior Vice President, Chief Financial Officer,
Treasurer and Secretary
(Principal Financial Officer)

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