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

FORM 10-Q

(Mark One)

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

For the quarterly period ended September 30, 2017

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: 001-35409

Merrimack Pharmaceuticals, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**04-3210530**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**
One Kendall Square, Suite B7201 Cambridge, MA	**02139**
(Address of principal executive offices)	**(Zip Code)**

(617) 441-1000
(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 ☒ No ☐

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

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

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☐
Emerging growth company	☐		

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

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

As of November 7, 2017, there were 13,332,967 shares of Common Stock, $0.01 par value per share, outstanding.

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FORWARD-LOOKING STATEMENTS

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

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

- our plans to develop and commercialize our clinical stage product candidates and diagnostics;
- our ongoing and planned discovery programs, preclinical studies and clinical trials;
- the timing of the completion of our clinical trials and the availability of results from such trials;
- our ability to establish and maintain collaborations for our product candidates;
- our receipt of payments related to the milestone events under the asset purchase and sale agreement with Ipsen S.A. or under the license and collaboration agreement between Baxalta Incorporated, Baxalta US Inc., Baxalta GmbH and Ipsen S.A., when expected or at all;
- the timing of and our ability to obtain and maintain regulatory approvals for our product candidates;
- the rate and degree of market acceptance and clinical utility of our products;
- our intellectual property position;
- our commercialization, marketing and manufacturing capabilities and strategy;
- the potential advantages of our systems biology approach to drug research and development;
- the potential use of our systems biology approach in fields other than oncology; and
- our estimates regarding expenses, future revenues, capital requirements and needs for additional financing.

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

You should read this Quarterly Report on Form 10-Q and the documents that we have filed as exhibits to this Quarterly Report on Form 10-Q completely and with the understanding that our actual future results may be materially different from what we expect. We do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

NOTE REGARDING TRADEMARKS

ONIVYDE® is a trademark of Ipsen S.A. Any other trademarks, trade names and service marks referred to in this Quarterly Report on Form 10-Q are the property of their respective owners.

PART I

FINANCIAL INFORMATION

Item 1. Financial Statements.

Merrimack Pharmaceuticals, Inc.
Condensed Consolidated Balance Sheets
(unaudited)

(in thousands, except per share amounts)	September 30, 2017	December 31, 2016
Assets		
Current assets:		
Cash and cash equivalents	$ 107,245	$ 21,524
Restricted cash	102	102
Accounts receivable, net	190	275
Prepaid expenses and other current assets	8,040	2,239
Assets held for sale	—	33,295
Total current assets	115,577	57,435
Restricted cash	60,682	674
Property and equipment, net	10,188	14,212
Equity method investment	11,400	—
Other assets	—	27
Assets held for sale, net of current portion	—	9,135
Total assets	$ 197,847	$ 81,483
Liabilities, non-controlling interest and stockholders' equity/(deficit)		
Current liabilities:		
Accounts payable, accrued expenses and other	$ 23,983	$ 29,369
Deferred rent	2,117	2,014
Accrued intraperiod tax allocation	6,613	—
Income taxes payable	1,844	—
Liabilities held for sale	—	56,839
Total current liabilities	34,557	88,222
Deferred rent, net of current portion	1,772	3,386
Long-term debt	49,884	216,861
Liabilities held for sale, net of current portion	—	25,673
Total liabilities	86,213	334,142
Commitments and contingencies (Note 10)		
Non-controlling interest		(1,539)
Stockholders' equity/(deficit):		
Preferred stock, $0.01 par value: 10,000 shares authorized at September 30, 2017 and December 31, 2016; no shares issued or outstanding at September 30, 2017 or December 31, 2016	—	—
Common stock, $0.01 par value: 20,000 shares authorized at September 30, 2017 and December 31, 2016; 13,274 and 13,020 shares issued and outstanding at September 30, 2017 and December 31, 2016, respectively	1,328	1,302
Additional paid-in capital	580,126	702,377
Accumulated (deficit)	(469,820)	(954,799)
Total stockholders' equity/(deficit)	111,634	(251,120)
Total liabilities, non-controlling interest and stockholders' equity/(deficit)	$ 197,847	$ 81,483

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

Merrimack Pharmaceuticals, Inc.
Condensed Consolidated Statements of Operations and Comprehensive Income (Loss)
(unaudited)

(in thousands, except per share amounts)	Three Months Ended September 30, 2017	Three Months Ended September 30, 2016	Nine Months Ended September 30, 2017	Nine Months Ended September 30, 2016
Costs and expenses:				
Research and development expenses	$ 13,598	$ 28,247	$ 54,954	$ 83,944
General and administrative expenses	3,366	6,448	23,798	21,038
Restructuring expenses	—	809	—	809
Total costs and expenses	16,964	35,504	78,752	105,791
Loss from continuing operations	(16,964)	(35,504)	(78,752)	(105,791)
Other income and expenses:				
Interest income	250	64	646	258
Interest expense	(1,659)	(1,560)	(30,400)	(20,708)
Gain on deconsolidation of Silver Creek Pharmaceuticals, Inc.	10,848	—	10,848	—
Gain on sale of asset	—	—	1,703	—
Other income (expense), net	69	385	(592)	278
Net loss from continuing operations before income tax benefit	(7,456)	(36,615)	(96,547)	(125,963)
Income tax benefit	2,133	9,770	32,372	9,770
Net loss from continuing operations	(5,323)	(26,845)	(64,175)	(116,193)
Discontinued operations:				
Income (loss) from discontinued operations, net of tax	8,456	(3,430)	547,994	(3,698)
Net income (loss)	3,133	(30,275)	483,819	(119,891)
Net income (loss) attributable to non-controlling interest	31	(207)	(1,160)	(600)
Net income (loss) attributable to Merrimack Pharmaceuticals, Inc.	$ 3,102	$ (30,068)	$ 484,979	$ (119,291)
Other comprehensive income (loss):				
Unrealized loss on available-for-sale securities	—	(3)	—	(2)
Other comprehensive loss	—	(3)	—	(2)
Comprehensive income (loss)	$ 3,102	$ (30,071)	$ 484,979	$ (119,293)
Amounts attributable to Merrimack Pharmaceuticals, Inc.:				
Net loss from continuing operations	$ (5,354)	$ (26,638)	$ (63,015)	$ (115,593)
Income (loss) from discontinued operations, net of tax	8,456	(3,430)	547,994	(3,698)
Net income (loss) attributable to Merrimack Pharmaceuticals, Inc.	$ 3,102	$ (30,068)	$ 484,979	$ (119,291)
Basic and dilutive net income (loss) per common share				
Net loss from continuing operations	$ (0.40)	$ (2.06)	$ (4.77)	$ (9.33)
Net income (loss) from discontinued operations, net of tax	0.64	(0.27)	41.52	(0.30)
Net income (loss) per share	$ 0.24	$ (2.33)	$ 36.75	$ (9.63)
Weighted-average common shares used per share calculations—basic and diluted	13,282	12,921	13,197	12,383
Cash dividend paid per common share	$ —	$ —	$ 10.55	$ —

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

Merrimack Pharmaceuticals, Inc.
Condensed Consolidated Statements of Cash Flows
(unaudited)

(in thousands)	Nine Months Ended September 30, 2017	2016
Cash flows from operating activities		
Net income (loss)	$ 483,819	$ (119,891)
Less:		
Income (loss) from discontinued operations	547,994	(3,698)
Loss from continuing operations	(64,175)	(116,193)
Adjustments to reconcile net loss to net cash used in operating activities		
Non-cash interest expense	3,352	4,672
Loss on extinguishment of debt	4,887	14,566
Benefit from intraperiod tax allocation	(32,372)	(9,970)
Depreciation and amortization expense	2,813	4,181
Non-cash activity related to discontinued operations	10,241	9,970
Gain on deconsolidation of Silver Creek Pharmaceuticals, Inc.	(10,848)	—
Loss (gain) on sale of property and equipment	(439)	187
Stock-based compensation expense	11,110	8,251
Changes in operating assets and liabilities:		
Accounts receivable	85	11
Prepaid expenses and other current assets	(6,205)	1,087
Income taxes payable	1,844	—
Accounts payable, accrued expenses and other	(3,140)	(4,061)
Deferred rent	(334)	493
Net cash used in continuing operations for operating activities	(83,181)	(86,806)
Net cash used in discontinuing operations for operating activities	(37,964)	(52,538)
Net cash used in operating activities	(121,145)	(139,344)
Cash flows from investing activities		
Purchase of property and equipment	(729)	(2,868)
Proceeds from maturities and sales of available for sale securities	—	72,160
Deconsolidation of Silver Creek Pharmaceuticals, Inc. cash	(4,002)	—
Proceeds on sale of property and equipment	1,094	—
Purchases of available for sale securities	—	(84,262)
Proceeds from sale of business	575,000	—
Changes in restricted cash	(60,008)	—
Net cash provided by (used in) investing activities	511,355	(14,970)
Cash flows from financing activities		
Proceeds from exercise of options to purchase common stock	6,517	4,007
Proceeds from issuance of Series C preferred stock by Silver Creek Pharmaceuticals, Inc., net of issuance costs	3,994	1,185
Repayment of debt	(175,000)	—
Payment of dividend	(140,000)	—
Other financing activities, net	—	(21)
Net cash provided by (used in) financing activities	(304,489)	5,171
Net increase (decrease) in cash and cash equivalents	85,721	(149,143)
Cash and cash equivalents, beginning of period	21,524	185,606
Cash and cash equivalents, end of period	$ 107,245	$ 36,463
Non-cash investing and financing activities		
Purchases of property and equipment in accounts payable, accrued expenses and other	$ 159	$ 105
Receivables related to stock option exercises in prepaid expenses and other current assets	—	39
Receivables related to property and equipment sale in other current assets	145	40
Transaction costs related to conversion of convertible notes due 2020 in accounts payable, accrued expenses and other	—	148
Principal amount of convertible notes due 2020 converted into shares of common stock	—	64,209

Supplemental disclosure of cash flows		
Cash paid for income taxes	6,122	—
Cash paid for interest	30,250	13,851

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

1. Nature of the Business

Merrimack Pharmaceuticals, Inc. (the "Company") is a biopharmaceutical company based in Cambridge, Massachusetts that is outthinking cancer to ensure that patients and their families live fulfilling lives. The Company's mission is to transform cancer care through the smart design and development of targeted solutions based on a deep understanding of cancer pathways and biological markers. All of the Company's development programs, including four clinical studies in distinct indications and six candidates in preclinical development, fit into the Company's strategy of (1) understanding the biological problems the Company is trying to solve, (2) designing specific solutions and (3) developing those solutions for biomarker-selected patients. This three-pronged strategy seeks to ensure optimal patient outcomes.

On April 3, 2017, the Company completed the previously announced transaction (the "Asset Sale") with Ipsen S.A. ("Ipsen"). Pursuant to the Asset Purchase and Sale Agreement, dated as of January 7, 2017 (the "Asset Sale Agreement"), between the Company and Ipsen, the Company sold to Ipsen its right, title and interest in the non-cash assets, equipment, inventory, contracts and intellectual property primarily related to or used in the Company's business operations and activities involving or relating to developing, manufacturing and commercializing ONIVYDE, the Company's first commercial product, and MM-436 (the "Commercial Business"). The Company received $575.0 million in cash, subject to a working capital adjustment, and is eligible to receive up to $450.0 million in additional regulatory approval-based milestone payments. The Company reached a settlement on certain working capital adjustments with Ipsen in the amount of $0.8 million, which was received in September 2017. The remaining working capital adjustment is currently estimated as a $4.9 million receivable presented in prepaid expenses and other currents assets within the condensed consolidated balance sheets, which was received in the fourth quarter of 2017. The Company also retained the right to receive net milestone payments of up to $33.0 million that may become payable pursuant to the license and collaboration agreement with Baxalta Incorporated, Baxalta US Inc. and Baxalta GmbH (collectively, "Baxalta") for the ex-U.S. development and commercialization of ONIVYDE.

The Company's non-commercial assets, including its clinical and preclinical development programs, were not included in the Asset Sale and remain assets of the Company. The Company's most advanced assets are as follows:

- MM-121 (seribantumab), a fully human monoclonal antibody that binds to the ErbB3 (HER3) receptor and targets heregulin positive cancers. There are two active development programs for MM-121, each in a Phase 2 clinical trial. The Company is currently conducting the Phase 2 randomized SHERLOC clinical trial, evaluating MM-121 in heregulin positive non-small cell lung cancer patients in combination with docetaxel. The Company has also initiated trial sites for the Phase 2 randomized SHERBOC clinical trial in patients with heregulin positive, hormone receptor positive, ErbB2 (HER2) negative, metastatic breast cancer in combination with fulvestrant, and expects to dose the first patient in the SHERBOC clinical trial in the fourth quarter of 2017;
- MM-141 (istiratumab), a fully human bispecific tetravalent monoclonal antibody designed to block tumor survival signals by targeting receptor complexes containing the insulin-like growth factor 1 ("IGF-1") receptor and ErbB3 (HER3) cell surface receptors. The Company is currently conducting and has completed enrollment of the Phase 2 randomized CARRIE clinical trial evaluating MM-141 in previously untreated metastatic pancreatic cancer patients with high levels of free IGF-1 in combination with nab-paclitaxel and gemcitabine; and
- MM-310, an antibody-directed nanotherapeutic ("ADN") that contains a novel prodrug of the highly potent chemotherapy docetaxel and targets the ephrin receptor A2 ("EphA2") receptor, which is highly expressed in most solid tumor types. MM-310 was designed to improve the therapeutic window of docetaxel in major oncology indications, such as prostate, ovarian, bladder, gastric, pancreatic and lung cancers. The Company initiated a Phase 1 clinical trial to evaluate safety and preliminary activity of MM-310 in the first quarter of 2017.

The Company is subject to risks and uncertainties common to companies in the biopharmaceutical industry, including, among other things, its ability to secure additional capital to fund operations, success of clinical trials, development by competitors of new technological innovations, dependence on collaborative arrangements, protection of proprietary technology, compliance with government regulations and dependence on key personnel. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval prior to commercialization. These efforts require significant amounts of capital, adequate personnel, infrastructure and extensive compliance reporting capabilities.

The accompanying condensed consolidated financial statements have been prepared on a basis which assumes that the Company will continue as a going concern and which contemplates the realization of assets and satisfaction of liabilities and commitments in the normal course of business. Until such time, if ever, as the Company can generate sufficient product revenues, the Company expects to finance its cash needs through a combination of equity offerings, debt financings, collaborations, licensing arrangements and other marketing and distribution arrangements. The Company could also engage in discussions with third parties regarding partnerships, joint ventures, combinations or divestitures of one or more of its businesses as it seeks to further the development of its research programs, improve its cash position and maximize stockholder value.

2. Basis of Presentation and Consolidation

The accompanying condensed consolidated financial statements as of September 30, 2017 and December 31, 2016, and for the three and nine months ended September 30, 2017 and 2016, have been prepared in accordance with the rules and regulations of the Securities and Exchange Commission (the "SEC") and generally accepted accounting principles in the United States of America ("GAAP") for condensed consolidated financial information. Accordingly, they do not include all of the information and footnotes required by GAAP for complete financial statements. In the opinion of management, these condensed consolidated financial statements reflect all adjustments which are necessary for a fair statement of the Company's financial position and results of its operations, as of and for the periods presented. These condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and notes thereto contained in the Company's Annual Report on Form 10-K for the year ended December 31, 2016 filed with the SEC on March 1, 2017.

The information presented in the condensed consolidated financial statements and related notes as of September 30, 2017, and for the three and nine months ended September 30, 2017 and 2016, is unaudited. The December 31, 2016 condensed consolidated balance sheets included herein were derived from the audited financial statements as of that date, but does not include all disclosures, including notes, required by GAAP for complete financial statements.

Interim results for the three and nine months ended September 30, 2017 are not necessarily indicative of the results that may be expected for the fiscal year ending December 31, 2017, or any future period.

As of March 31, 2017, the Commercial Business met all the conditions to be classified as a discontinued operation since the disposal of the Commercial Business represented a strategic shift that will have a major effect on the Company's operations and financial results. The Company will not have further significant involvement in the operations of the discontinued Commercial Business. The operating results of the Commercial Business are reported as a loss from discontinued operations, net of tax in the condensed consolidated statements of operations and comprehensive income (loss) for all periods presented. The gain recognized on the sale of the Commercial Business is presented in income (loss) from discontinued operations, net of tax in the consolidated statement of operations and comprehensive income (loss). In addition, in the condensed consolidated balance sheets as of December 31, 2016, the assets and liabilities held for sale have been presented separately. For additional information, see Note 3, "Sale of Commercial Business."

The condensed consolidated financial statements have historically included the accounts of the Company and Silver Creek Pharmaceuticals, Inc. ("Silver Creek") with all intercompany transactions and balances eliminated in consolidation. Silver Creek represented a variable interest entity that the Company consolidated as the primary beneficiary. As discussed in Note 12, "Investment in Silver Creek," Silver Creek completed a preferred stock financing in the third quarter of 2017, which reduced the Company's ownership percentage in Silver Creek below 50% and resulted in the Company no longer controlling the Silver Creek board of directors. The Company determined that it is no longer the primary beneficiary of Silver Creek since the Company does not control the board of directors and does not direct the activities that have the most significant impact on Silver Creek's economic performance. Therefore, the Company deconsolidated Silver Creek from its financial statements in the third quarter of 2017 in accordance with Accounting Standards Codification ("ASC") 810-10-40-4(c), *Consolidation*. The Company accounts for its investment in Silver Creek under the equity method of accounting as of September 30, 2017.

The Company's consolidated balance sheet at December 31, 2016, as reported, included Silver Creek's assets and liabilities, after intercompany eliminations. The Company's unaudited consolidated balance sheet at September 30, 2017 does not include the assets and liabilities of Silver Creek since the Company deconsolidated Silver Creek in the third quarter of 2017.

The Company's unaudited consolidated statements of operations for the nine months ended September 30, 2017 include Silver Creek's results for the period through July 13, 2017, the day immediately preceding the deconsolidation of Silver Creek. For the three and nine months ended September 30, 2016, the Company's unaudited consolidated results include Silver Creek's results for the full periods presented.

On August 11, 2017, the Company's stockholders approved an amendment to the Company's certificate of incorporation to effect a one-for-ten reverse stock split of its issued and outstanding common stock (the "Reverse Split"). On September 5, 2017, the Company filed the amendment to its certificate of incorporation to effect the Reverse Split, and on September 6, 2017, the Reverse Split was effective for trading purposes. As a result of the Reverse Split, every ten shares of common stock issued and outstanding was converted into one share of common stock, reducing the number of issued and outstanding shares of common stock from approximately 132.8 million shares to approximately 13.28 million shares. No fractional shares were issued in connection with the Reverse Split. The amendment to the certificate of incorporation also proportionately reduced the number of authorized shares of common stock from 200 million to 20 million. The Reverse Split did not change the par value of the common stock. The Reverse Split did not change the number of authorized shares or par value of the Company's preferred stock, of which there are no shares issued or outstanding. All outstanding stock options and convertible notes entitling their holders to purchase shares of common stock or acquire shares of common stock upon conversion, as the case may be, were adjusted as a result of the Reverse Split, as required by the terms of these securities. For additional information, see Note 11, "Stock Compensation."

3. Sale of Commercial Business

Ipsen

On April 3, 2017, the Company completed the sale of the Commercial Business to Ipsen. Pursuant to the Asset Sale Agreement, the Company may be entitled to up to $450.0 million in additional payments based on the achievement by or on behalf of Ipsen of certain milestone events if the U.S. Food and Drug Administration (the "FDA") approves ONIVYDE for certain indications as follows: (i) $225.0 million upon the regulatory approval by the FDA of ONIVYDE for the first-line treatment of metastatic adenocarcinoma of the pancreas (a) in combination with fluorouracil and leucovorin (with or without oxaliplatin), (b) in combination with gemcitabine and abraxane or (c) following submission and filing of regulatory approval by Ipsen for purposes of commercialization by Ipsen; (ii) $150.0 million upon the regulatory approval by the FDA of ONIVYDE for the treatment of small cell lung cancer after failure of first-line chemotherapy; and (iii) $75.0 million upon the regulatory approval by the FDA of ONIVYDE for an additional indication unrelated to those described above.

In connection with the sale of the Commercial Business, on April 3, 2017, the Company entered into a transition services agreement with Ipsen pursuant to which the Company and Ipsen are providing certain services to each other for a period of 24 months following the closing, including Ipsen's agreement to manufacture MM-310 and to perform certain quality related services in accordance with a manufacturing services agreement, the accounting impact of which is immaterial.

In connection with the completion of the Asset Sale, on April 3, 2017, the Company irrevocably deposited the redemption price of the 11.50% senior secured notes due 2022 (the "2022 Notes") of $175.0 million outstanding aggregate principal amount, interest of $7.4 million through the redemption date and an additional make-whole premium payment of approximately $20.1 million with U.S. Bank National Association as trustee (the "Trustee") under the Indenture dated as of December 22, 2015 (the "Indenture") and irrevocably instructed the Trustee to apply such amount to the redemption in full of the 2022 Notes on the redemption date of April 27, 2017. The Indenture was satisfied and discharged on April 3, 2017.

In connection with the completion of the Asset Sale, on April 3, 2017, the Company entered into a sublease with Ipsen, pursuant to which Ipsen is subleasing from the Company approximately 70,237 square feet of leased space in the Company's Cambridge, Massachusetts facility through the end of the term of the lease on June 30, 2019. Payments under the sublease are recorded as an offset to rent expense in the condensed consolidated statement of operations and comprehensive income (loss).

Also in connection with the completion of the Asset Sale, on April 3, 2017, the Company entered into an intellectual property license agreement with Ipsen, pursuant to which Ipsen granted to the Company a perpetual, worldwide, non-exclusive, royalty-free, fully paid-up license in and to all patents included in the transferred intellectual property, other than certain patents relating to generic liposomal technology, with respect to which the license will be exclusive, in each case for use outside of the Commercial Business. The Company granted to Ipsen a non-exclusive, royalty-free, fully paid up, perpetual, irrevocable and worldwide license to all patents it owned at the time of the closing of the transaction contemplated by the Asset Sale Agreement for use in connection with the Commercial Business. This transfer of intellectual property did not impact the financial statements as no amounts related to the intellectual property had previously been recorded.

On April 5, 2017, the Company announced that its Board of Directors authorized and declared a special cash dividend of $140.0 million on the Company's common stock. The special dividend was payable on May 26, 2017 to stockholders of record as of the close of business on May 17, 2017. The special dividend resulted in a decrease to additional paid-in capital.

Discontinued Operations and Assets Held for Sale

The condensed consolidated financial statements for the three and nine months ended September 30, 2017 and 2016 reflect the operations of the Commercial Business as a discontinued operation. For the three months ended September 30, 2017, the Company recorded a gain of $3.5 million on the Asset Sale, resulting from an increase in the estimated working capital adjustment. The Company reached a settlement on certain working capital adjustments with Ipsen in the amount of $0.8 million, which was received in September 2017. The remaining working capital adjustment is currently estimated as a $4.9 million receivable that was received in the fourth quarter of 2017. For the nine months ended September 30, 2017, the Company recorded a gain of approximately $601.7 million on the Asset Sale, which is included in gain from discontinued operations on the condensed consolidated statements of operations and comprehensive income (loss). Discontinued operations for the three and nine months ended September 30, 2017 and 2016 includes the following:

(in thousands)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2017	2016	2017	2016
Revenues:				
Product revenues, net	$ —	$ 14,493	$ 16,135	$ 37,312
License and collaboration revenues	—	12,417	7,797	43,062
Other revenues	—	1,161	1,973	2,659
Total revenues	—	28,071	25,905	83,033
Costs and expenses:				
Cost of revenues	—	1,010	3,890	3,593
Research and development expenses	—	3,830	3,730	22,012
Selling, general and administrative expenses	—	11,600	8,732	35,485
Restructuring expenses	—	—	9,535	—
Total costs and expenses	—	16,440	25,887	61,090
Other income and expenses:				
Interest expense	—	(5,291)	(6,743)	(15,871)
Gain on sale of commercial business	3,497	—	601,670	—
Income from discontinued operations	$ 3,497	$ 6,340	$ 594,945	$ 6,072
Income tax benefit (expense)	4,959	(9,770)	(46,951)	(9,770)
Total income (loss) from discontinued operations	$ 8,456	$ (3,430)	$ 547,994	$ (3,698)

The carrying value of the assets and liabilities of the Commercial Business classified as “Discontinued operations” in the condensed consolidated balance sheets is as follows:

(in thousands)	December 31, 2016
Assets	
Current assets:	
Accounts receivable, net	$ 17,194
Inventory	14,554
Prepaid expenses and other current assets	1,547
Total current assets held for sale	33,295
Property and equipment, net	1,553
Intangible assets, net	3,977
Goodwill	3,605
Total long-term assets held for sale	9,135
Liabilities	
Current liabilities:	
Accounts payable, accrued expenses and other	20,613
Deferred revenues	36,226
Total current liabilities held for sale	56,839
Deferred revenues, net of current portion	25,673
Total liabilities held for sale	25,673

Inventory

Inventory of the Commercial Business as of December 31, 2016 consisted of the following:

(in thousands)	December 31, 2016
Raw materials	$ 4,483
Work in process	8,651
Finished goods	1,420
Total inventory	$ 14,554

Restructuring Activities

On January 8, 2017, the Company announced a reduction in headcount by approximately 30% in connection with the Asset Sale and the completion of its strategic pipeline review. Upon the closing of the Asset Sale and the completion of its strategic pipeline review, the Company had approximately 80 employees.

Under this corporate restructuring, for the three and nine months ended September 30, 2017, the Company recognized total restructuring expenses of $0.0 million and $9.5 million, respectively, which was related to contractual termination benefits for employees with pre-existing severance arrangements. These one-time employee termination benefits are comprised of severance, benefits and related costs, all of which are expected to result in cash expenditures. The majority of these payments were made during the second quarter of 2017. The remaining payments represent severance payments that will be paid over one year. The expense of $9.5 million was included in discontinued operations, as the costs are directly associated with the sale of the Commercial Business.

The following table summarizes the charges related to the restructuring activities as of September 30, 2017:

(in thousands)	Accrued Restructuring Expenses at December 31, 2016	Expenses	Less: Payments	Accrued Restructuring Expenses at September 30, 2017
Severance, benefits and related costs	$ —	$ 9,521	$ 8,434	$ 1,087
Totals	$ —	$ 9,521	$ 8,434	$ 1,087

These amounts are included in accounts payable, accrued expenses and other in the September 30, 2017 balance sheet.

License and Collaboration Agreements Related to the Asset Sale

Baxalta

On September 23, 2014, the Company and Baxter International Inc., Baxter Healthcare Corporation and Baxter Healthcare SA entered into a license and collaboration agreement (the “Baxalta Agreement”) for the development and commercialization of ONIVYDE outside of the United States and Taiwan (the “Licensed Territory”). In connection with Baxter International Inc.’s separation of the Baxalta business, the Baxalta Agreement was assigned to Baxalta during the second quarter of 2015. As part of the Baxalta Agreement, the Company granted Baxalta an exclusive, royalty-bearing right and license under the Company’s patent rights and know-how to develop and commercialize ONIVYDE in the Licensed Territory.

On April 3, 2017, the Baxalta Agreement and all related agreements, including the Company’s agreement related to the commercial supply of ONIVYDE, were assigned to Ipsen in connection with the Asset Sale. Pursuant to the Asset Sale Agreement, the Company retained the right to receive net milestone payments of up to $33.0 million that may become payable pursuant to the Baxalta Agreement for the ex-U.S. development and commercialization of ONIVYDE, which is comprised of potential payments of $18.0 million from the sale of ONIVYDE in two additional major European countries, $5.0 million related to the sale of ONIVYDE in the first major non-European, non-Asian country and $10.0 million for the first patient dosed in a pivotal clinical trial in an indication other than pancreatic cancer.

PharmaEngine, Inc.

On May 5, 2011, the Company and PharmaEngine, Inc. (“PharmaEngine”) entered into an assignment, sublicense and collaboration agreement (the “PharmaEngine Agreement”) under which the Company reacquired rights in Europe and certain countries in Asia to ONIVYDE. In exchange, the Company agreed to pay PharmaEngine a nonrefundable, noncreditable upfront

payment of $10.0 million and up to an additional $80.0 million in aggregate development and regulatory milestones and $130.0 million in aggregate sales milestones.

On April 3, 2017, the PharmaEngine Agreement and all related agreements, including the Company's agreement related to its commercial supply of ONIVYDE, were assigned to Ipsen in connection with the Asset Sale.

4. Going Concern

In accordance with ASC 205-40, *Going Concern*, the Company has evaluated whether there are conditions and events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the condensed consolidated financial statements are issued.

As of December 31, 2016, the Company had $21.5 million in unrestricted cash and cash equivalents, had suffered recurring losses from operations and had negative working capital and cash outflows from operating activities. Based on the evaluation completed in connection with the filing of the Company's Annual Report on Form 10-K for the year ended December 31, 2016, including consideration of management's plans, the Company previously concluded that there was substantial doubt as to its ability to continue as a going concern within one year after March 1, 2017, the date that the consolidated financial statements were issued.

On April 3, 2017, the Company closed the Asset Sale with Ipsen and received a $575.0 million upfront cash payment, subject to a working capital adjustment. The Company reached a settlement on certain working capital adjustments with Ipsen in the amount of $0.8 million, which was received in September 2017. The remaining working capital adjustment is currently estimated as a $4.9 million receivable that was received in the fourth quarter of 2017. The Company used a portion of the cash payment to redeem the $175.0 million outstanding aggregate principal amount of the 2022 Notes, which also required an additional make-whole premium payment of approximately $20.1 million, and deposited $60.0 million into an escrow account in response to a lawsuit filed by the trustee and certain holders of its 4.50% convertible notes due 2020 (the "Convertible Notes"). The Company distributed $140.0 million of the upfront cash payment in the form of a special cash dividend to stockholders, which was payable on May 26, 2017 to stockholders of record as of the close of business on May 17, 2017. After consideration of the Company's cash and cash equivalents balance at March 31, 2017 of $17.2 million and the net proceeds from the Asset Sale, the Company has concluded that the previous conditions and events that raised substantial doubt about its ability to continue as a going concern have been alleviated. The Company updated its going concern assessment for the three months ended September 30, 2017 and concluded the Company is able to continue as a going concern within one year after the date that the condensed consolidated financial statements are issued.

5. Income Taxes

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

The Company completed the Asset Sale and recorded the income tax implications of the sale in the second quarter of 2017. The Asset Sale generated taxable income for the Company which has resulted in income tax expense. The Company released a portion of its valuation allowance in the three months ended June 30, 2017 as it is now able to utilize its net operating loss carryforwards to offset the taxable income generated from the Asset Sale. The Company's current income tax expense for the nine months ended September 30, 2017 is $8.0 million, which is comprised primarily of federal Alternative Minimum Tax and state income tax. As of September 30, 2017, the income tax payable was $1.8 million.

Intraperiod tax allocation rules require the Company to allocate the provision for income taxes between continuing operations and other categories of earnings, such as discontinued operations. In periods in which there is pre-tax loss from continuing operations and pre-tax income in other categories of earnings, such as discontinued operations, the Company must allocate to continuing operations a tax benefit for the loss in continuing operations with an offsetting tax expense to discontinued operations.

For the three and nine months ended September 30, 2017, the Company recognized an income tax benefit of $2.1 million and $32.4 million, respectively, in continuing operations and income tax benefit in discontinued operations of $5.0 million and income tax expense of $47.0 million, respectively, related to the income generated in connection with the Asset Sale. For the three and nine months ended September 30, 2016, the Company recognized an income tax benefit of $9.8 million in continuing operations and income tax expense in discontinued operations of $9.8 million.

In connection with the Asset Sale, the Company recorded an income tax provision in discontinued operations of $224.3 million prior to the release of the valuation allowance. The Company released $177.4 million of its valuation allowance in discontinued operations, resulting in a total income tax expense of $47.0 million in discontinued operations for the nine months ended September 30, 2017.

6. Net Income (Loss) Per Common Share

Basic net income (loss) per share is calculated by dividing the net income (loss) attributable to Merrimack Pharmaceuticals, Inc. by the weighted-average number of common shares outstanding during the period.

Diluted net income (loss) per share is computed by dividing the net income (loss) attributable to Merrimack Pharmaceuticals, Inc. by the weighted-average number of dilutive common shares outstanding during the period. Dilutive shares outstanding is calculated by adding to the weighted shares outstanding any potential (unissued) shares of common stock from outstanding stock options based on the treasury stock method. In a period when a net loss is reported, all common stock equivalents are excluded from the calculation because they would have an anti-dilutive effect, meaning the loss per share would be reduced. Therefore, in periods where a loss is reported, there is no difference in basic and dilutive loss per share.

The Company follows the two-class method when computing net income (loss) per share, when it has issued shares that meet the definition participating securities. 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 participating 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 on their respective rights to receive dividends, as if all income for the period has been distributed or losses to be allocated if they are contractually required to fund losses. There were no amounts allocated to participating securities for the three and nine months ended September 30, 2017 and 2016, as the Company was in a loss position and had no shares that met the definition of participating securities outstanding as of September 30, 2017 and 2016.

In addition, as discussed in Note 10, “Borrowings,” in July 2013, the Company issued $125.0 million aggregate principal amount of Convertible Notes in an underwritten public offering. Following the repayment and satisfaction in full of the Company’s obligations to Hercules Technology Growth Capital, Inc. (“Hercules”) under its Loan and Security Agreement with Hercules (the “Loan Agreement”), which occurred in December 2015, upon any conversion of the Convertible Notes, the Convertible Notes may be settled, at the Company’s election, in cash, shares of the Company’s common stock or a combination of cash and shares of the Company’s common stock. For purposes of calculating the maximum dilutive impact, it is presumed that the conversion premium will be settled in common stock, inclusive of a contractual make-whole provision resulting from a fundamental change, and the resulting potential common shares included in diluted earnings per share if the effect is more dilutive. As of September 30, 2017, $60.8 million aggregate principal amount of the Convertible Notes remained outstanding.

The stock options and conversion premium on the Convertible Notes are excluded from the calculation of diluted loss per share because the net loss for the three and nine months ended September 30, 2016 causes such securities to be anti-dilutive. Outstanding securities excluded from the calculation of diluted loss per share for the three and nine months ended September 30, 2017 and 2016 are shown in the chart below:

	Three Months Ended September 30,		Nine Months Ended September 30,	
(in thousands)	**2017**	**2016**	**2017**	**2016**
Outstanding options to purchase common stock	1,824	2,100	1,824	2,100
Conversion of the Convertible Notes	1,216	1,216	1,216	1,216

7. Fair Value of Financial Instruments

Fair value is an exit price, representing the amount that would be received from the sale of an asset or paid to transfer a liability in an orderly transaction between market participants. Fair value is determined based on observable and unobservable inputs. Observable inputs reflect readily obtainable data from independent sources, while unobservable inputs reflect certain market assumptions. As a basis for considering such assumptions, GAAP establishes a three-tier value hierarchy, which prioritizes the inputs used to develop the assumptions and for measuring fair value as follows: (Level 1) observable inputs such as quoted prices in active markets for identical assets; (Level 2) inputs other than the quoted prices in active markets that are observable either directly or indirectly; and (Level 3) unobservable inputs in which there is little or no market data, which requires the Company to develop its own assumptions. This hierarchy requires the Company to use observable market data, when available, and to minimize the use of unobservable inputs when determining fair value.

Recurring Fair Value Measurements

The carrying values of cash, restricted cash, prepaid expenses, accounts receivable, accounts payable and accrued expenses, and other short-term assets and liabilities approximate their respective fair values due to the short-term maturities of these assets and liabilities.

The following tables show assets measured at fair value on a recurring basis as of September 30, 2017 and December 31, 2016:

(in thousands)	September 30, 2017 Level 1	Level 2	Level 3
Assets:			
Money market funds	$ 99,079	$ —	$ —
Totals	$ 99,079	$ —	$ —

(in thousands)	December 31, 2016 Level 1	Level 2	Level 3
Assets:			
Money market funds	$ 12,373	$ —	$ —
Totals	$ 12,373	$ —	$ —
Liabilities:			
Silver Creek warrant liability	$ —	$ —	$ 1,499
Totals	$ —	$ —	$ 1,499

In December 2016, Silver Creek issued warrants to purchase an aggregate of 1.9 million shares of Silver Creek Series C preferred stock (the "Silver Creek warrants"). During the first quarter of 2017, Silver Creek issued additional Silver Creek warrants to purchase an aggregate of 1.8 million shares of Silver Creek Series C preferred stock. During the second quarter of 2017, Silver Creek issued additional Silver Creek warrants to purchase an aggregate of 0.3 million shares of Silver Creek Series C preferred stock. In June 2017, Silver Creek amended the outstanding warrant purchase agreements to increase the number of shares for which each warrant is redeemable.

During the third quarter of 2017, Silver Creek completed its Series C preferred stock financing, issuing 2.0 million shares of Series C preferred stock at $1.50 per share for proceeds of $2.9 million. In conjunction with this sale, Silver Creek also issued warrants to purchase 1.7 million shares of Series C preferred stock to investors. The sale of additional shares of Series C preferred stock in the third quarter resulted in the deconsolidation of Silver Creek, effective July 14, 2017. As such, the Company valued the warrants on that date. The warrants were valued at $5.2 million and $1.5 million as of July 14, 2017 and December 31, 2016, respectively, using a Black-Scholes option pricing model, probability-weighted for different exercise scenarios. The key assumptions utilized in the Black-Scholes option pricing model as of July 14, 2017 were a risk-free interest rate of 2.1%, expected dividend yield of 0.0%, expected volatility of 60.0% and expected term of 6.4 years – 7.0 years. The key assumptions utilized in the Black-Scholes option pricing model as of December 31, 2016 were a risk-free interest rate of 2.3%, expected dividend yield of 0.0%, expected volatility of 61.7% and expected term of 6.9 years. Changes in the fair value of the Silver Creek warrants are recognized as a component of "other income and expenses" in the condensed consolidated statements of operations and comprehensive income (loss). The change in fair value for the three and nine months ended September 30, 2017 was $0.1 million and $1.1 million, respectively, and is recorded in other income (expense) on the statement of operations and comprehensive loss.

There were no changes in valuation techniques or transfers between the fair value measurement levels during the three or nine months ended September 30, 2017 or during the year ended December 31, 2016.

Other Fair Value Measurements

The estimated fair value of the Convertible Notes was $51.0 million as of September 30, 2017. The Company estimated the fair value of the Convertible Notes by using a quoted market rate in an inactive market, which is classified as a Level 2 input. The carrying value of the Convertible Notes was $49.9 million as of September 30, 2017 due to the bifurcation of the conversion feature of the Convertible Notes as described more fully in Note 10, "Borrowings."

As discussed in Note 10, "Borrowings," in December 2015, the Company closed a private placement of $175.0 million aggregate principal amount of 2022 Notes. The Company estimated the fair value of the 2022 Notes by using publicly-available information related to one of the 2022 Notes borrower's portfolio of debt investments based on unobservable inputs, which is classified as a Level 3 input. In connection with the completion of the Asset Sale, on April 3, 2017, the liability under the 2022 Notes was satisfied. The Company incurred a loss on extinguishment of $25.0 million as a result of the early repayment of the 2022 Notes, which is included in interest expense on the statement of operations. For additional information, see Note 3, "Sale of Commercial Business."

8. Marketable Securities

As of both September 30, 2017 and December 31, 2016, the Company maintained only cash equivalents comprised of money market funds. As of September 30, 2017, the Company did not hold any securities that were in an unrealized loss position. There were no realized gains or losses on available-for-sale securities for the three or nine months ended September 30, 2017 or 2016.

9. Accounts Payable, Accrued Expenses and Other

Accounts payable, accrued expenses and other as of September 30, 2017 and December 31, 2016 consisted of the following:

(in thousands)	September 30, 2017	December 31, 2016
Accounts payable	$ 8,835	$ 2,692
Accrued goods and services	4,688	8,233
Accrued clinical trial costs	3,845	8,776
Accrued drug purchase costs	950	480
Accrued payroll and related benefits	2,500	3,394
Accrued severance expenses	1,166	774
Accrued interest	578	2,100
Accrued dividends payable	19	19
Silver Creek warrant liability	—	1,499
Deferred tax incentives	1,402	1,402
Total accounts payable, accrued expenses and other	$ 23,983	$ 29,369

10. Borrowings

2022 Notes

On December 22, 2015, the Company closed a private placement of $175.0 million aggregate principal amount of 2022 Notes. As a result of this placement, the Company received net proceeds of approximately $168.5 million, after deducting private placement and offering expenses payable by the Company. The 2022 Notes bore interest at a rate of 11.50% per year, payable semi-annually on June 15 and December 15 of each year, beginning on June 15, 2016. The 2022 Notes contained customary covenants, including covenants that limited or restricted the Company's ability to incur liens, incur indebtedness and make certain restricted payments, but did not contain covenants related to future financial performance. The 2022 Notes were secured by a first priority lien on substantially all of the Company's assets.

In connection with the completion of the Asset Sale on April 3, 2017, the liability under the 2022 Notes was satisfied. As a result of the early repayment, a loss on extinguishment of $25.0 million was recognized in interest expense in the condensed consolidated statement of operations and comprehensive income (loss) for the nine months ended September 30, 2017. The $25.0 million loss on extinguishment included a $20.1 million prepayment penalty and $4.9 million of amortization expense recognized for the remaining debt discount at settlement as a result of the early repayment. For the three and nine months ended September 30, 2017, interest expense related to the 2022 Notes was $0.0 million and $6.7 million, respectively. For the three and nine months ended September 30, 2016, interest expense related to the 2022 Notes was $5.2 million and $15.6 million, respectively. These amounts are included in discontinued operations.

Convertible Notes

In July 2013, the Company issued $125.0 million aggregate principal amount of Convertible Notes in an underwritten public offering. As a result of the Convertible Notes offering, the Company received net proceeds of approximately $120.6 million, after deducting underwriting discounts and commissions and offering expenses payable by the Company.

The Convertible Notes bear interest at a rate of 4.50% per year, payable semiannually in arrears on January 15 and July 15 of each year, beginning on January 15, 2014. The Convertible Notes are general unsecured senior obligations of the Company and rank (i) senior in right of payment to any of the Company's indebtedness that is expressly subordinated in right of payment to the Convertible Notes, (ii) equal in right of payment to any of the Company's unsecured indebtedness that is not so subordinated, (iii) effectively junior in right of payment to any of the Company's secured indebtedness to the extent of the value of the assets securing such indebtedness and (iv) structurally junior to all indebtedness and other liabilities (including trade payables) of the Company's subsidiaries.

The Company separately accounted for the liability and equity components of the Convertible Notes by bifurcating gross proceeds between the indebtedness, or liability component, and the embedded conversion option, or equity component. This bifurcation was done by estimating an effective interest rate as of the date of issuance for similar notes which do not contain an embedded conversion option. The gross proceeds received from the issuance of the Convertible Notes less the initial amount allocated to the indebtedness resulted in a $53.8 million allocation to the embedded conversion option. The embedded conversion option was recorded in stockholders' deficit and as debt discount, to be subsequently amortized as interest expense over the term of the Convertible Notes. Underwriting discounts and commissions and offering expenses totaled $4.4 million and were allocated to the indebtedness and the embedded conversion option based on their relative values.

On April 13, 2016, the Company entered into separate, privately-negotiated conversion agreements (the "Conversion Agreements") with certain holders of the Convertible Notes. Under the Conversion Agreements, such holders agreed to convert an aggregate principal amount of $64.2 million of Convertible Notes held by them. The Company initially settled each $1,000 principal amount of Convertible Notes surrendered for conversion by delivering 136 shares of the Company's common stock on April 18, 2016. In total, the Company issued an aggregate of 8,732,152 shares of its common stock on this initial closing date. In addition, pursuant to the Conversion Agreements, at the additional closings (as defined in the Conversion Agreements), the Company issued an aggregate of 3,635,511 shares of the Company's common stock representing an aggregate of $27.7 million as additional payments in respect of the conversion of the Convertible Notes. The number of additional shares was determined based on the daily VWAP (as defined in the Conversion Agreements) of the Company's common stock for each of the trading days in the 10-day trading period following the date of the Conversion Agreements. The issuance of 12,367,663 total shares of the Company's common stock pursuant to the Conversion Agreements resulted in an increase to common stock and additional paid-in capital of $101.0 million.

As a result of the conversion, the Company recognized an overall loss on extinguishment of $14.6 million representing the difference between the total settlement consideration transferred to the holders that was attributed to the liability component of the Convertible Notes, based on the fair value of that component at the time of conversion, and the net carrying value of the liability. The loss on extinguishment was recorded as interest expense during the second quarter of 2016. The remaining settlement consideration transferred was allocated to the reacquisition of the embedded conversion option and recognized as a $39.8 million reduction of additional paid-in capital. Transaction costs incurred with third parties related to the conversion were allocated to the liability and equity components and resulted in an additional $0.2 million of interest expense and a $0.2 million reduction of additional paid-in capital.

The outstanding Convertible Notes will mature on July 15, 2020 (the "Maturity Date"), unless earlier repurchased by the Company or converted at the option of holders. Holders may convert their Convertible Notes at their option at any time prior to the close of business on the business day immediately preceding April 15, 2020 only under the following circumstances:

- during any calendar quarter commencing after September 30, 2013 (and only during such calendar quarter), if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price on each applicable trading day;
- during the five business day period after any five consecutive trading day period (the "measurement period") in which the trading price (as defined in the Convertible Notes) per $1,000 principal amount of Convertible Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the Company's common stock and the conversion rate on each such trading day; or
- upon the occurrence of specified corporate events set forth in the indenture governing the Convertible Notes.

On or after April 15, 2020 until the close of business on the business day immediately preceding the Maturity Date, holders may convert their Convertible Notes at any time, regardless of the foregoing circumstances.

Following the repayment and satisfaction in full of the Company's obligations to Hercules under the Loan Agreement, which occurred in December 2015, upon any conversion of the Convertible Notes, the Convertible Notes may be settled, at the Company's election, in cash, shares of the Company's common stock or a combination of cash and shares of the Company's common stock.

The initial conversion rate of the Convertible Notes was 160.0000 shares of the Company's common stock per $1,000 principal amount of Convertible Notes, which is equivalent to an initial conversion price of $6.25 per share of common stock. As a result of the special dividend that was payable on May 26, 2017 to stockholders of record as of the close of business on May 17, 2017, the conversion rate of the Convertible Notes was adjusted from 160.0000 shares of the Company's common stock per $1,000 principal amount of Convertible Notes to 235.2112 shares of the Company's common stock per $1,000 principal amount of Convertible Notes. As a result of the one-for-ten reverse stock split of the Company's common stock effected on September 5, 2017, the conversion rate of the Convertible Notes was further adjusted from 235.2112 shares of the Company's common stock per $1,000 principal amount of

Convertible Notes to 23.5210 shares of the Company's common stock per $1,000 principal amount of Convertible Notes. The conversion rate will be subject to further adjustment in some events, but will not be adjusted for any accrued and unpaid interest. In addition, following certain corporate events that occur prior to the Maturity Date, the Company will increase the conversion rate for a holder who elects to convert its Convertible Notes in connection with such a corporate event in certain circumstances.

In connection with a lawsuit filed by the trustee and certain holders of the Convertible Notes in the Court of Chancery in the State of Delaware, captioned *Wells Fargo Bank, National Association, Wolverine Flagship Fund Trading Limited, Highbridge International LLC, and Highbridge Tactical Credit & Convertibles Master Fund, L.P. v. Merrimack Pharmaceuticals, Inc.* (the "Delaware Action"), the Company deposited $60.0 million in proceeds from the Asset Sale into an escrow account. The funds will remain in escrow for the duration of the Delaware Action in order to provide security to the plaintiffs for their claims in the Delaware Action. For additional information regarding the Delaware Action, see Note 14, "Subsequent Events."

For the three and nine months ended September 30, 2017, interest expense related to the Convertible Notes was $1.7 million and $5.0 million, respectively. For the three and nine months ended September 30, 2016, interest expense related to the Convertible Notes was $1.7 million and $21.1 million, respectively. The year-over-year decrease was primarily attributable to interest expense related to a reduction in the principal based on the conversion of some of the Convertible Notes that occurred in April 2016.

Future Minimum Payments under Outstanding Borrowings

Future minimum payments under outstanding borrowings as of September 30, 2017 are as follows:

(in thousands)	Convertible Notes
Remainder of 2017	$ —
2018	2,736
2019	2,736
2020 and thereafter	63,526
Total	68,998
Less interest	(8,207)
Less unamortized discount	(10,907)
Less current portion	—
Long-term debt	$ 49,884

11. Stock-Based Compensation

As of December 31, 2015, there were 0.3 million shares of common stock available to be granted under the Company's 2011 Stock Incentive Plan (the "2011 Plan"). The 2011 Plan is administered by the Company's Board of Directors and permits the Company to grant incentive and non-qualified stock options, stock appreciation rights, restricted stock, restricted stock units and other stock-based awards.

In February 2016, 0.4 million additional shares of common stock became available for grant to employees, officers, directors and consultants under the 2011 Plan. At September 30, 2017, there were 0.3 million shares remaining available for grant under the 2011 Plan.

During the three and nine months ended September 30, 2017, the Company issued options to purchase 0.2 million and 2.1 million shares of common stock, respectively. During the three and nine months ended September 30, 2016 the Company issued options to purchase 0.0 million and 0.4 million shares of common stock, respectively. These options generally vest over a three-year period for employees. Options granted to directors vest immediately.

As described in Note 3, "Sale of Commercial Business," the Board of Directors authorized and declared a special cash dividend of $140.0 million on the Company's common stock, which was payable on May 26, 2017 to stockholders of record as of the close of business on May 17, 2017. The Board of Directors determined, in accordance with the adjustment provision of each of the Company's 1999 Stock Option Plan, as amended, the 2008 Stock Incentive Plan, as amended, and the 2011 Plan (collectively, the "Equity Plans"), that the special cash dividend was unusual and non-recurring and that appropriate adjustment to the stock options to purchase shares of the Corporation's common stock outstanding under the Equity Plans was required. The Company treated this adjustment as a modification to the original stock option grant because the terms of the agreements were modified in order to preserve the value of the option awards after a large non-recurring cash dividend. The calculation of the incremental compensation expense is based on the excess of the fair value of the award measured immediately before and after the modification. As a result, the Company recognized an incremental compensation expense of $5.6 million associated with the modification that occurred in the second quarter of 2017.

On August 11, 2017, the Company's stockholders approved an amendment to the Company's certificate of incorporation to effect the Reverse Split. On September 5, 2017, the Company filed the amendment to its certificate of incorporation to effect the Reverse Split, and on September 6, 2017, the Reverse Split was effective for trading purposes. As a result of the Reverse Split, every ten shares of common stock issued and outstanding was converted into one share of common stock, reducing the number of issued and outstanding shares of common stock from approximately 132.8 million shares to approximately 13.28 million shares. No fractional shares were issued in connection with the Reverse Split. The amendment to the certificate of incorporation also proportionately reduced the number of authorized shares of common stock from 200 million to 20 million. The Reverse Split did not change the par value of the common stock. The Reverse Split did not change the number of authorized shares or par value of the Company's preferred stock, of which there are no shares issued or outstanding. All outstanding stock options and convertible notes entitling their holders to purchase shares of common stock or acquire shares of common stock upon conversion, as the case may be, were adjusted as a result of the Reverse Split, as required by the terms of these securities.

The fair value of stock options granted to employees during the three and nine months ended September 30, 2017 and 2016 was estimated at the date of grant using the following assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2017	2016	2017	2016
Risk-free interest rate	1.7 – 1.8%	1.1 – 1.4%	1.7 – 2.1%	1.1 – 1.5%
Expected dividend yield	0%	0%	0%	0%
Expected term	5.0 – 5.8 years	5.8 years	5.0 – 6.1 years	5.0 – 5.8 years
Expected volatility	64 – 66%	67%	64 – 68%	67 – 69%

The Company uses the simplified method to calculate the expected term, as it does not have sufficient historical exercise data to provide a reasonable basis upon which to estimate expected term. The computation of expected volatility is based on the historical volatility of comparable companies from a representative peer group selected based on industry and market capitalization. The risk-free interest rate is based on a treasury instrument whose term is consistent with the expected life of the stock options. Management estimates expected forfeitures based on historical experience and recognizes compensation costs only for those equity awards expected to vest.

In March 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2016-09, "Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting," which simplifies several areas of accounting for share-based payment transactions, including the income tax consequences, classification of awards as either liabilities or equity and classification of excess tax benefits on the statement of cash flows. This guidance also permits a new entity-wide accounting policy election to either estimate the number of awards that are expected to vest or account for forfeitures when they occur. The Company adopted the guidance, electing to account for forfeitures when they occur, and it did not have an impact on the consolidated financial statements.

The Company recognized stock-based compensation expense during the three and nine months ended September 30, 2017 and 2016 as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
(in thousands)	2017	2016	2017	2016
Employee awards:				
Research and development expense	$ 734	$ 1,216	$ 6,118	$ 4,206
General and administrative expense	846	958	4,992	4,045
Total stock-based compensation expense	$ 1,580	$ 2,174	$ 11,110	$ 8,251

The following table summarizes stock option activity during the nine months ended September 30, 2017:

(in thousands, except per share amounts)	Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding at December 31, 2016	1,902	$ 57.68	5.97	$ 7,564
Granted	2,098	$ 23.77		
Exercised	(290)	$ 21.74		
Forfeited	(1,886)	$ 59.37		
Outstanding at September 30, 2017	1,824	$ 22.65	6.21	$ 1,187
Vested and expected to vest at September 30, 2017	1,822	$ 22.64	6.21	$ 1,187
Exercisable at September 30, 2017	1,159	$ 26.71	4.34	$ 969

The weighted-average grant date fair value per share of stock options granted during the three and nine months ended September 30, 2017 was $7.68 and $4.06, respectively. The weighted-average grant date fair value per share of stock options granted during the three and nine months ended September 30, 2016 was $30.66 and $33.19, respectively.

The aggregate intrinsic value is calculated as the difference between the exercise price of the stock options and the fair value of the underlying common stock. The aggregate intrinsic value of stock options exercised during the three and nine months ended September 30, 2017 was $0.0 million and $2.3 million, respectively. The aggregate intrinsic value of stock options exercised during the three and nine months ended September 30, 2016 was $1.1 million and $3.8 million, respectively.

As of September 30, 2017, there was $5.7 million of total unrecognized stock-based compensation expense related to unvested employee stock awards. The Company expects to recognize this expense over a weighted-average period of approximately 2.77 years.

12. Investment in Silver Creek

On August 20, 2010, the Company acquired a controlling financial interest in Silver Creek. At such time, the Company had the ability to direct the activities of Silver Creek that most significantly impacted Silver Creek's economic performance through its ownership percentage and through the board of director seats controlled by the Company. As such, Silver Creek was consolidated by the Company.

Since the Company acquired its financial interest, Silver Creek has raised funding through the issuance of Series A, B and C preferred stock. The Company has not participated in any Silver Creek financings nor has it provided any funding. As of December 31, 2016, the Company held an ownership interest in Silver Creek greater than 50% and maintained the ability to control the board of directors and the activities that most significantly impacted the economic performance of Silver Creek.

During the third quarter of 2017, Silver Creek completed its Series C preferred stock financing, which reduced the Company's ownership percentage in Silver Creek below 50% and resulted in the Company no longer controlling the Silver Creek board of directors. As of September 30, 2017, the Company's ownership percentage in Silver Creek was approximately 43%. The Company determined that it is no longer the primary beneficiary of Silver Creek since the Company does not control the board of directors and does not direct the activities that have the most significant impact on Silver Creek's economic performance. Therefore, the Company deconsolidated Silver Creek from its financial statements on July 13, 2017 in accordance with ASC 810-10-40-4(c), *Consolidation*. Starting on July 14, 2017, the Company accounted for its investment in Silver Creek under the equity method of accounting as it has the ability to exercise significant influence over Silver Creek. Under the equity method of accounting, the Company will record its proportionate share of the investee's earnings (losses) in its results of operations with a corresponding increase (decrease) in the carrying value of the investment. Silver Creek continues to be a related party to the Company after deconsolidation.

The Company recorded a gain on the deconsolidation of Silver Creek of $10.8 million for the three and nine months ended September 30, 2017 in the condensed consolidated statement of operations and comprehensive income (loss). On the date of deconsolidation, the fair value of the Company's investment in Silver Creek exceeded the Company's share of the net assets of Silver Creek, which generated the gain. On July 14, 2017, the Company recorded its investment in Silver Creek at a fair value of $11.4 million, which was based on a third party valuation report. The gain on deconsolidation includes the following:

(in thousands)		
Fair value of the Company's retained investment in Silver Creek	$	11,400
Carrying value of non-controlling interest		(1,852)
Derecognition of Silver Creek's net liabilities		1,300
Gain recognized on deconsolidation of Silver Creek	$	10,848

The change in the non-controlling interest related to Silver Creek was as follows:

(in thousands)		Non-Controlling Interest
Balance at December 31, 2016	$	(1,539)
Net loss attributable to Silver Creek through July 13, 2017		(1,160)
Issuance of Silver Creek Series C preferred stock		847
Balance at date of deconsolidation		(1,852)
Carrying value of non-controlling interest		1,852
Balance at September 30, 2017	$	—

(in thousands)		Non-Controlling Interest
Balance at December 31, 2015	$	239
Net loss attributable to Silver Creek		(600)
Balance at September 30, 2016	$	(361)

13. Recent Accounting Pronouncements

In May 2014, the FASB issued ASU 2014-09, “Revenue from Contracts with Customers (Topic 606),” which supersedes all existing revenue recognition requirements, including most industry-specific guidance. The new standard requires a company to recognize revenue when it transfers goods or services to customers in an amount that reflects the consideration that the company expects to receive for those goods or services. This guidance was originally effective for interim and annual periods beginning after December 15, 2016 and allows for adoption using a full retrospective method, or a modified retrospective method. Early adoption was originally not permitted. Subsequent to the issuance of ASU 2014-09, the FASB also issued the following updates related to ASC 606, *Revenue from Contracts with Customers*:

- In August 2015, the FASB issued ASU 2015-14, “Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date,” whereby the effective date for the new revenue standard was deferred by one year. As a result of ASU 2015-14, the new revenue standard is now effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017, and early adoption is now permitted for annual periods beginning after December 15, 2016, including interim periods within that annual period.
- In March 2016, the FASB issued ASU 2016-08, “Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net),” to clarify the implementation guidance on principal versus agent considerations.
- In April 2016, the FASB issued ASU 2016-10, “Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing,” to clarify the principle for determining whether a good or service is “separately identifiable” from other promises in the contract and to clarify the categorization of licenses of intellectual property.
- In May 2016, the FASB issued ASU 2016-12, “Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Technical Expedients,” to clarify guidance on transition, determining collectability, non-cash consideration and the presentation of sales and other similar taxes.

The Company does not currently have any revenue generating contracts with customers due to the sale of its commercial business in the second quarter of 2017. The Company expects to adopt the new revenue standard on January 1, 2018 using the modified retrospective approach.

In January 2016, the FASB issued ASU 2016-01, “Financial Instruments – Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Liabilities,” which contains a number of provisions related to the measurement, presentation and disclosure of financial instruments. This guidance will be effective for annual reporting periods beginning after December 15, 2017,

including interim periods within those annual periods. Early adoption of this guidance is not permitted with the exception of certain specific presentation requirements that are not currently applicable to the Company. The Company does not anticipate a material impact to the consolidated financial statements as a result of the adoption of this guidance.

In February 2016, the FASB issued ASU 2016-02, "Leases (Topic 842)," which supersedes all existing lease accounting guidance within ASC 840, *Leases*. The new standard requires that lease assets and lease liabilities be recognized by lessees for those leases previously classified as operating leases under ASC 840, with limited exceptions. This update also creates a new definition of a lease and provides guidance as to whether a contract is or contains a lease. This guidance will be effective for annual reporting periods beginning after December 15, 2018, including interim periods within those annual reporting periods, and early adoption is permitted. The Company is currently evaluating the potential impact that the adoption of this guidance may have on the consolidated financial statements.

In June 2016, the FASB issued ASU 2016-13, "Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments," which represents a new credit loss standard that will change the impairment model for most financial assets and certain other financial instruments. Specifically, this guidance will require entities to utilize a new "expected loss" model as it relates to trade and other receivables. In addition, entities will be required to recognize an allowance for estimated credit losses on available-for-sale debt securities, regardless of the length of time that a security has been in an unrealized loss position. This guidance will be effective for annual reporting periods beginning after December 15, 2019, including interim periods within those annual reporting periods, and early adoption is permitted. The Company is currently evaluating the potential impact that the adoption of this guidance may have on the consolidated financial statements.

In August 2016, the FASB issued ASU 2016-15, "Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments," which is intended to reduce diversity in practice in how entities present certain types of cash transactions in the statement of cash flows. This guidance also clarifies how the predominance principle should be applied when classifying cash receipts and cash payments that have attributes of more than one class of cash flows. This guidance will be effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual reporting periods, and early adoption is permitted. An entity that elects early adoption must adopt all of the amendments in the same period. The Company does not anticipate a material impact to the consolidated financial statements as a result of the adoption of this guidance.

In May 2017, the FASB issued ASU 2017-09, "Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting," which provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. The standard should be applied prospectively to awards modified on or after the adoption date. This guidance will be effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017. Early adoption is permitted, including adoption in any interim period. The Company is currently evaluating the potential impact that the adoption of this guidance may have on the consolidated financial statements.

Other accounting standards that have been issued by the FASB or other standards-setting bodies that do not require adoption until a future date are not expected to have a material impact on the Company's consolidated financial statements upon adoption.

14. Subsequent Events

On October 6, 2017, the Company entered into a settlement agreement (the "Settlement Agreement") to resolve the Delaware Action. In accordance with the Settlement Agreement, the Company paid $32.5 million in cash to the noteholder plaintiffs, which represents $0.90 per each $1.00 of Convertible Notes held by the noteholder plaintiffs, plus accrued and unpaid interest on the Convertible Notes held by the noteholder plaintiffs through October 2, 2017. The noteholder plaintiffs collectively held approximately $35.8 million aggregate principal amount of the Convertible Notes. In addition, the Company paid a total of $3.8 million in attorneys' fees and expenses to the plaintiffs' attorneys. The noteholder plaintiffs have executed a full release in favor of the Company for any claims arising out of or related to the Delaware Action or the Convertible Notes, which release shall become effective upon the occurrence of certain conditions. The Company paid such settlement amounts on or about October 11, 2017.

On October 13, 2017, in connection with the entry into the Settlement Agreement, the Company commenced a cash tender offer (the "Tender Offer") to purchase any and all of its remaining $25.0 million aggregate principal amount of outstanding Convertible Notes. Upon the terms and subject to the conditions set forth in the Company's Offer to Purchase, dated October 13, 2017, and the related Letter of Transmittal, the Company is offering to pay, in cash, an amount equal to $900 per $1,000 principal amount of Convertible Notes purchased, plus accrued and unpaid interest to, but not including, the date of purchase. The Tender Offer will expire on November 10, 2017, or any other date and time to which the Company extends such Tender Offer, unless earlier terminated.

On October 16, 2017, the Company and Ipsen reached agreement on the final working capital adjustment related to the Asset Sale, resulting in the Company receiving cash proceeds of $4.9 million.

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

The following discussion of our financial condition and results of operations should be read in conjunction with our financial statements and the notes to those financial statements appearing elsewhere in this Quarterly Report on Form 10-Q and the audited consolidated financial statements and notes thereto and management's discussion and analysis of financial condition and results of operations for the year ended December 31, 2016 included in our Annual Report on Form 10-K. This discussion contains forward-looking statements that involve significant risks and uncertainties. As a result of many factors, such as those set forth in Part II, Item 1A. Risk Factors of this Quarterly Report on Form 10-Q, which are incorporated herein by reference, our actual results may differ materially from those anticipated in these forward-looking statements.

Overview

We are a biopharmaceutical company based in Cambridge, Massachusetts that is outthinking cancer to ensure that patients and their families live fulfilling lives. Our mission is to transform cancer care through the smart design and development of targeted solutions based on a deep understanding of cancer pathways and biological markers. All of our development programs, including four clinical studies in distinct indications and six candidates in preclinical development, fit into our strategy of (1) understanding the biological problems we are trying to solve, (2) designing specific solutions and (3) developing those solutions for biomarker-selected patients. This three-pronged strategy seeks to ensure optimal patient outcomes.

On April 3, 2017, we announced that we commenced operating as a refocused research and clinical development company in connection with the completion of our previously announced transaction, or the asset sale, with Ipsen S.A., or Ipsen. Pursuant to the Asset Purchase and Sale Agreement, dated as of January 7, 2017, or the asset sale agreement, between us and Ipsen, Ipsen acquired our right, title and interest in the non-cash assets, equipment, inventory, contracts and intellectual property primarily related to or used in our business operations and activities involving or relating to developing, manufacturing and commercializing ONIVYDE, our first commercial product, and MM-436, or the commercial business. We received $575.0 million in cash, subject to a working capital adjustment, and are eligible to receive up to $450.0 million in additional regulatory approval-based milestone payments. We reached a settlement on certain working capital adjustments with Ipsen in the amount of $0.8 million, which was received in September 2017. The remaining working capital adjustment is estimated as a $4.9 million receivable that was received in the fourth quarter of 2017. We also retained the right to receive net milestone payments of up to $33.0 million that may become payable pursuant to the license and collaboration agreement with Baxalta Incorporated, Baxalta US Inc. and Baxalta GmbH, collectively Baxalta, which we refer to as the Baxalta agreement, for the ex-U.S. development and commercialization of ONIVYDE. As of September 30, 2017, all historical transactions impacting the condensed consolidated statements of operations and comprehensive income (loss) related to the asset sale have been reclassified under discontinued operations.

Our non-commercial assets, including our clinical and preclinical development programs, or the pipeline business, were not included in the asset sale and remain assets of ours. Our most advanced assets are as follows:

- MM-121 (seribantumab), a fully human monoclonal antibody that binds to the ErbB3 (HER3) receptor and targets heregulin positive cancers. There are two active development programs for MM-121, each in a Phase 2 clinical trial. We are currently conducting the Phase 2 randomized SHERLOC clinical trial, evaluating MM-121 in heregulin positive non-small cell lung cancer patients in combination with docetaxel. We have also initiated trial sites for the Phase 2 randomized SHERBOC clinical trial in patients with heregulin positive, hormone receptor positive, ErbB2 (HER2) negative, metastatic breast cancer in combination with fulvestrant, and expect to dose the first patient in the SHERBOC clinical trial in the fourth quarter of 2017;
- MM-141 (istiratumab), a fully human bispecific tetravalent monoclonal antibody designed to block tumor survival signals by targeting receptor complexes containing the insulin-like growth factor 1, or IGF-1, receptor and ErbB3 (HER3) cell surface receptors. We are currently conducting and have completed enrollment of the Phase 2 randomized CARRIE clinical trial evaluating MM-141 in previously untreated metastatic pancreatic cancer patients with high levels of free IGF-1 in combination with nab-paclitaxel and gemcitabine; and
- MM-310, an antibody-directed nanotherapeutic, or ADN, that contains a novel prodrug of the highly potent chemotherapy docetaxel and targets the ephrin receptor A2, or EphA2, receptor, which is highly expressed in most solid tumor types. MM-310 was designed to improve the therapeutic window of docetaxel in major oncology indications, such as prostate, ovarian, bladder, gastric, pancreatic and lung cancers. We initiated a Phase 1 clinical trial to evaluate safety and preliminary activity of MM-310 in the first quarter of 2017.

On January 8, 2017, we announced a planned reduction in our headcount by approximately 30% in connection with the closing of the asset sale and the completion of our strategic pipeline review, and upon the closing of the asset sale we had approximately 80 employees.

We have devoted substantially all of our resources to our drug discovery and development efforts, including advancing our systems biology approach, conducting clinical trials for our product candidates, protecting our intellectual property and providing general and administrative support for these operations. We currently have no products approved for sale and all of our revenue to date has been collaboration revenue and through sales of ONIVYDE and, to date, we have financed our operations primarily through private placements of our convertible preferred stock, collaborations, public offerings of our securities, secured debt financings, sales of ONIVYDE and the asset sale of ONIVYDE.

As of September 30, 2017, we had unrestricted cash and cash equivalents and marketable securities of $107.2 million. We believe that at our currently forecasted spending rates, our existing financial resources, together with the net milestone payments we expect to receive under the Baxalta agreement, assuming certain milestones under such agreement are met, will be sufficient to fund our planned operations into the second half of 2019.

We have never been profitable and, as of September 30, 2017, we had an accumulated deficit of $469.8 million. Our net loss from continuing operations before income tax benefit was $7.5 million and $96.5 million for the three and nine months ended September 30, 2017, respectively. Our net loss from continuing operations before income tax benefit was $36.6 million and $126.0 million for the three and nine months ended September 30, 2016, respectively. We expect to continue to incur significant expenses and operating losses for at least the next several years. We expect to continue to incur significant research and development expenses in connection with our ongoing activities, particularly as we continue the research, development and clinical trials of our product candidates, including multiple simultaneous clinical trials for certain product candidates. Until such time, if ever, as we can generate sufficient product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, licensing arrangements and other marketing and distribution arrangements. We also could engage in discussions with third parties regarding partnerships, joint ventures, combinations or divestitures of one or more of our businesses as we seek to further the development of our research programs, improve our cash position and maximize stockholder value. There can be no assurance as to the timing, terms or consummation of any financing, collaboration, licensing arrangement or other marketing and distribution arrangement, partnership, joint venture, combination or divestiture. We may be unable to raise capital when needed or on attractive terms, which would force us to delay, limit, reduce or terminate our research and development programs. We will need to generate significant revenues to achieve profitability, and we may never do so.

Silver Creek Pharmaceuticals, Inc., or Silver Creek, completed its Series C preferred stock financing in the third quarter of 2017, as a result of which our percentage ownership interest in Silver Creek declined below 50%. As a result, we no longer control the Silver Creek board of directors and do not direct the activities that have the most significant impact on Silver Creek's economic performance. We have therefore deconsolidated Silver Creek's financial statements and results of operations. See Note 12, "Investment in Silver Creek," in the accompanying notes to the condensed consolidated financial statements for additional information.

On August 11, 2017, our stockholders approved an amendment to our certificate of incorporation to effect a one-for-ten reverse stock split of our issued and outstanding common stock, or the reverse split. On September 5, 2017, we filed the amendment to our certificate of incorporation to effect the reverse split, and on September 6, 2017, the reverse split was effective for trading purposes. As a result of the reverse split, every ten shares of common stock issued and outstanding was converted into one share of common stock, reducing the number of issued and outstanding shares of common stock from approximately 132.8 million shares to approximately 13.28 million shares. No fractional shares were issued in connection with the reverse split. The amendment to the certificate of incorporation also proportionately reduced the number of authorized shares of common stock from 200 million to 20 million. The reverse split did not change the par value of the common stock. The reverse split did not change the number of authorized shares or par value of our preferred stock, of which there are no shares issued or outstanding. All outstanding stock options and convertible notes entitling their holders to purchase shares of common stock or acquire shares of common stock upon conversion, as the case may be, were adjusted as a result of the reverse split, as required by the terms of these securities.

Strategic Partnerships, Licenses and Collaborations

Ipsen

Pursuant to the asset sale agreement, we are eligible to receive up to $450.0 million in additional regulatory approval-based milestone payments. We also retained the right to receive net milestone payments that may become payable pursuant to the Baxalta agreement for the ex-U.S. development and commercialization of ONIVYDE for up to $33.0 million.

In connection with the asset sale, we entered into a transition services agreement with Ipsen, pursuant to which we and Ipsen provide certain services to each other for a period of 24 months, including Ipsen's agreement to manufacture MM-310 and to perform certain quality related services in accordance with a manufacturing services agreement. Additionally, we entered into a sublease agreement with Ipsen under which Ipsen is subleasing approximately 70,237 square feet of our leased space in Cambridge, Massachusetts through the end of our lease term on June 30, 2019.

Baxalta

On September 23, 2014, we entered into the Baxalta agreement for the development and commercialization of ONIVYDE outside of the United States and Taiwan, or the licensed territory. In connection with Baxter International Inc.'s separation of the Baxalta business, the Baxalta agreement was assigned to Baxalta during the second quarter of 2015. As part of the Baxalta agreement, we granted Baxalta an exclusive, royalty-bearing right and license under our patent rights and know-how to develop and commercialize ONIVYDE in the licensed territory.

On April 3, 2017, the Baxalta agreement was assigned to Ipsen in connection with the completion of the sale of the commercial business. We retained the right to receive net milestone payments that may become payable pursuant to the Baxalta agreement for the ex-U.S. development and commercialization of ONIVYDE for up to $33.0 million, which is comprised of potential payments of $18.0 million from the sale of ONIVYDE in two additional major European countries, $5.0 million related to the sale of ONIVYDE in the first major non-European, non-Asian country and $10.0 million for the first patient dosed in a pivotal clinical trial in an indication other than pancreatic cancer.

On April 3, 2017, in connection with the asset sale, all agreements related to our collaboration with Baxalta and any associated obligations, including our agreement related to commercial supply of ONIVYDE, were assigned to Ipsen.

Actavis

In November 2013, we entered into a development, license and supply agreement with Watson Laboratories, Inc., or Actavis, which we refer to as the Actavis agreement, pursuant to which we agreed to develop, manufacture and exclusively supply the bulk form of doxorubicin hydrochloride (HCl) liposome injection to Actavis. On April 3, 2017, in connection with the completion of the asset sale, the Actavis agreement was assigned to Ipsen.

Financial Obligations Related to the License and Development of ONIVYDE

In September 2005, Hermes BioSciences, Inc., or Hermes, which we acquired in October 2009, entered into a license agreement with PharmaEngine, Inc., or PharmaEngine, under which PharmaEngine received an exclusive license to research, develop, manufacture and commercialize ONIVYDE in Europe and certain countries in Asia. In May 2011, we entered into a new agreement with PharmaEngine, which we refer to as the PharmaEngine agreement, under which we reacquired all previously licensed rights for ONIVYDE, other than rights to commercialize ONIVYDE in Taiwan. As a result, we had the exclusive right to commercialize ONIVYDE in all territories in the world, except for Taiwan, where PharmaEngine has an exclusive commercialization right.

On April 3, 2017, in connection with the asset sale, the PharmaEngine agreement and all related agreements and any associated obligations, including our agreement related to our commercial supply of ONIVYDE to PharmaEngine, were assigned to Ipsen.

Financial Operations Overview

Revenues

As a result of the asset sale, all revenue related to the Commercial Business has been reclassified under discontinued operations.

In the future, we may generate revenue from a combination of research and development payments, license fees and other upfront payments, milestone payments, product sales and royalties in connection with future collaborations and licenses. We expect that any revenue we generate will fluctuate in future periods as a result of the timing of our or a collaborator's achievement of preclinical, clinical, regulatory and commercialization milestones, if at all, the timing and amount of any payments to us relating to such milestones and the extent to which any of our product candidates are approved and successfully commercialized by us or a collaborator. If we fail, or any future collaborator fails, to develop product candidates in a timely manner or obtain regulatory approval for them, our ability to generate future revenue, and our results of operations and financial position, would be materially adversely affected.

Research and development expenses

Research and development expenses consist of the costs associated with our research and discovery activities, including investment in our systems biology approach, conduct of preclinical studies and clinical trials, manufacturing development efforts and activities related to regulatory filings. Our research and development expenses consist of:

- employee salaries and related expenses, which include stock-based compensation and benefits for the personnel involved in our drug discovery and development activities;
- external research and development expenses incurred under agreements with third-party contract research organizations and investigative sites;
- manufacturing material expense for third-party manufacturing organizations and consultants, including costs associated with manufacturing product prior to product approval;
- license fees for and milestone payments related to in-licensed products and technologies; and
- facilities, depreciation and other allocated expenses, which include direct and allocated expenses for rent and maintenance of facilities, depreciation of leasehold improvements and equipment, and laboratory and other supplies.

We expense research and development costs as incurred. Conducting a significant amount of research and development is central to our business model. Product candidates in late stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of late stage clinical trials. We expect to maintain or increase our research and development expenses for the foreseeable future as we continue to develop our clinical stage product candidates and further advance our preclinical products and earlier stage research and development projects.

We use our employee and infrastructure resources across multiple research and development programs. We track expenses related to our most advanced product candidates on a per project basis. Accordingly, we allocate internal employee-related and infrastructure costs, as well as third-party costs, to each of these programs. We do not allocate to particular development programs either stock-based compensation expense or expenses related to preclinical programs. Costs that are not directly attributable to specific clinical programs, such as wages related to shared laboratory services, travel and employee training and development, are not allocated and are considered general research and discovery expenses.

The following table summarizes our principal product development programs, including the research and development expenses allocated to each clinical product candidate, for the three and nine months ended September 30, 2017 and 2016:

	Three Months Ended September 30,		Nine Months Ended September 30,	
(in thousands)	**2017**	**2016**	**2017**	**2016**
MM-121	$ 3,520	$ 4,302	$ 10,427	$ 14,341
MM-141	2,456	5,489	8,874	9,715
MM-310	2,553	1,679	4,836	4,670
Preclinical, general research and discovery	4,053	9,684	19,152	29,970
Legacy programs (MM-302, MM-151, MM-131)	282	5,877	5,547	21,042
Stock-based compensation	734	1,216	6,118	4,206
Total research and development expenses	$ 13,598	$ 28,247	$ 54,954	$ 83,944

In connection with the asset sale, all expenses related to the Commercial Business have been reclassified under discontinued operations.

The successful development of our clinical and preclinical product candidates is highly uncertain. At this time, other than as discussed below, we cannot reasonably estimate the nature, timing or costs of the efforts that will be necessary to complete the remainder of the development of any of our preclinical or clinical product candidates or the period, if any, in which material net cash flows from these product candidates may commence. This is due to the numerous risks and uncertainties associated with developing drugs, including the uncertainty of:

- the scope, rate of progress and expense of our ongoing, as well as any additional, clinical trials and other research and development activities;
- the potential benefits of our product candidates over other therapies;

- our ability to market, commercialize and achieve market acceptance for any of our product candidates that we are developing or may develop in the future;
- future clinical trial results;
- the terms and timing of regulatory approvals; and
- the expense of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights.

A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. For example, if the U.S. Food and Drug Administration, or FDA, or another regulatory authority were to require us to conduct clinical trials beyond those which we currently anticipate will be required for the completion of clinical development of a product candidate or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development.

MM-121 (seribantumab)

In February 2015, we initiated the Phase 2 randomized SHERLOC clinical trial of MM-121 in patients with heregulin positive non-small cell lung cancer, and we anticipate top-line results in the second half of 2018.

Additionally, we have initiated trial sites for the Phase 2 randomized SHERBOC clinical trial of MM-121 in patients with heregulin positive, hormone receptor positive, ErbB2 (HER2) negative, metastatic breast cancer, and expect to dose the first patient in the SHERBOC clinical trial in the fourth quarter of 2017.

MM-141 (istiratumab)

In May 2015, we initiated the Phase 2 randomized CARRIE clinical trial of MM-141 in patients with previously untreated metastatic pancreatic cancer with high levels of free IGF-1 in combination with nab-paclitaxel and gemcitabine. Enrollment in the CARRIE clinical trial is complete, and we anticipate top-line results in the first half of 2018.

MM-310

In March 2017, we initiated a Phase 1 clinical trial of MM-310 in solid tumors to assess the safety and preliminary activity of MM-310. We expect safety data and the recommended Phase 2 dose in the second half of 2018.

General and administrative expenses

General and administrative expenses consist primarily of salaries and other related costs for personnel, including stock-based compensation expenses and benefits, in our commercial, legal, intellectual property, business development, finance, information technology, corporate communications, investor relations and human resources departments. Other general and administrative expenses include costs to support employee training and development, board of directors costs, depreciation, insurance expenses, facility-related costs not otherwise included in research and development expenses, professional fees for legal services, including patent-related expenses, and accounting and information technology services. We expect to maintain general and administrative expenses in future periods as we continue to support the development and commercialization of our clinical products.

Restructuring expenses

As a result of the corporate restructuring activities described above, we recognized total restructuring expenses of $0.0 million and $9.5 million during the three and nine months ended September 30, 2017, respectively, related to contractual termination benefits for employees with pre-existing severance arrangements and one-time employee termination benefits. These one-time employee termination benefits are comprised of severance, benefits and related costs, all of which are expected to result in cash expenditures. The majority of these payments were made during the second quarter of 2017. The total restructuring expenses for the three and nine months ended September 30, 2017 have been recorded within discontinued operations.

Interest expense

Interest expense consists primarily of cash and non-cash interest related to our 4.50% convertible notes due 2020, or the convertible notes, for the three months ended September 30, 2017, and our 11.50% senior secured notes due 2022, or the 2022 notes, for all other periods presented.

On April 3, 2017, in connection with the completion of the asset sale, we irrevocably deposited the aggregate redemption price of the 2022 notes, plus accrued and unpaid interest of $7.4 million, with U.S. Bank National Association as trustee under the Indenture, dated as of December 22, 2015, or the indenture, and irrevocably instructed the trustee to apply such amount to the redemption in full of the 2022 notes on the redemption date of April 27, 2017. The indenture was satisfied and discharged on April 3, 2017.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our condensed consolidated financial statements, which we have prepared in accordance with the rules and regulations of the Securities and Exchange Commission, or the SEC, and generally accepted accounting principles in the United States, or GAAP. The preparation of these condensed consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenues and expenses during the reporting periods. We evaluate our estimates and judgments on an ongoing basis. Estimates include estimated service periods and services to be completed under a collaboration, useful lives with respect to long-lived assets and intangible assets, accounting for stock-based compensation, contingencies, intangible assets, goodwill, in-process research and development, tax valuation reserves and accrued expenses. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Our actual results may differ from these estimates under different assumptions or conditions.

Our critical accounting policies and the methodologies and assumptions we apply under them have not materially changed since March 1, 2017, the date we filed our Annual Report on Form 10-K for the year ended December 31, 2016, other than those noted in Note 3, "Sale of Commercial Business," and Note 12, "Investment in Silver Creek," in the accompanying notes to the condensed consolidated financial statements. For more information on our critical accounting policies, refer to our Annual Report on Form 10-K for the year ended December 31, 2016.

Results of Operations

Comparison of the three months ended September 30, 2017 and 2016

	Three Months Ended September 30,	
(in thousands)	**2017**	**2016**
Research and development expenses	$ (13,598)	$ (28,247)
General and administrative expenses	(3,366)	(6,448)
Restructuring expenses	—	(809)
Loss from continuing operations	(16,964)	(35,504)
Interest income	250	64
Interest expense	(1,659)	(1,560)
Gain on deconsolidation of Silver Creek	10,848	
Gain on sale of assets	—	—
Other expense, net	69	385
Net loss from continuing operations before income tax benefit	$ (7,456)	$ (36,615)

Research and development expenses

Research and development expenses were $13.6 million for the three months ended September 30, 2017 compared to $28.2 million for the three months ended September 30, 2016, a decrease of $14.6 million, or 52%. This decrease was primarily attributable to:

- $5.6 million of decreased expenses related to our legacy programs as a result of our prioritization of MM-121, MM-141 and MM-310 and close-out activities associated with the legacy programs; and
- $5.6 million of decreased expenses related to our preclinical, general research and discovery efforts related to the refocus of our early stage development spend and lower overhead costs to support general research and development expense related to the reduction in headcount.

General and administrative expenses

General and administrative expenses were $3.4 million for the three months ended September 30, 2017 compared to $6.4 million for the three months ended September 30, 2016, a decrease of $3.0 million, or 47%. This decrease was primarily attributable to a decrease in corporate expenses related to headcount and stock-based compensation.

Interest expense

Interest expense was $1.7 million for the three months ended September 30, 2017 compared to $1.6 million for the three months ended September 30, 2016, an increase of $0.1 million, or 6%. This increase was primarily attributable to the timing of interest expense related to the convertible notes.

Gain on deconsolidation

We deconsolidated Silver Creek from our financial statements in the third quarter of 2017 on July 13, 2017, the date we were no longer the primary beneficiary of Silver Creek, in accordance with Accounting Standards Codification, or ASC, 810-10-40-4(c), *Consolidation*. As a result, we recorded a gain on the deconsolidation of Silver Creek of $10.8 million for the three and nine months ended September 30, 2017 in our condensed consolidated statement of operations and comprehensive income (loss).

Income tax benefit (expense)

For the three months ended September 30, 2017, we recognized an income tax benefit within continuing operations of $2.1 million and in discontinued operations of $5.0 million related to taxable income generated during the three months ended September 30, 2017 as a result of the asset sale. For the three months ended September 30, 2016, we recognized an income tax benefit of $9.8 million in continuing operations and income tax expense of $9.8 million in discontinued operations.

Discontinued operations

For the three months ended September 30, 2017, we recognized income from discontinued operations, net of tax of $8.5 million as a result of an increase in the estimated working capital adjustment and income tax benefit. For the three months ended September 30, 2016, we recognized a loss from discontinued operations, net of tax of $3.4 million.

Comparison of the nine months ended September 30, 2017 and 2016

	Nine Months Ended September 30,	
(in thousands)	**2017**	**2016**
Research and development expenses	$ (54,954)	$ (83,944)
General and administrative expenses	(23,798)	(21,038)
Restructuring expenses	—	(809)
Loss from continuing operations	(78,752)	(105,791)
Interest income	646	258
Interest expense	(30,400)	(20,708)
Gain on deconsolidation of Silver Creek	10,848	—
Gain on sale of assets	1,703	—
Other income (expense), net	(592)	278
Net loss from continuing operations before income tax benefit	$ (96,547)	$ (125,963)

Research and development expenses

Research and development expenses were $55.0 million for the nine months ended September 30, 2017 compared to $83.9 million for the nine months ended September 30, 2016, a decrease of $28.9 million, or 35%. This decrease was primarily attributable to:

- $15.5 million of decreased expenses related to our legacy programs as a result of our prioritization of MM-121, MM-141 and MM-310 and close-out activities associated with the legacy programs;
- $10.8 million of decreased expenses related to our preclinical, general research and discovery related to the refocus of early stage development spend and lower overhead costs to support general research and development expense related to the reduction in headcount.

General and administrative expenses

General and administrative expenses were $23.8 million for the nine months ended September 30, 2017 compared to $21.0 million for the nine months ended September 30, 2016, an increase of $2.8 million, or 13%. This increase was primarily attributable to the costs associated with the transition following the asset sale, including legal expenses and stock-based compensation.

Interest expense

Interest expense was $30.4 million for the nine months ended September 30, 2017 compared to $20.7 million for the nine months ended September 30, 2016, an increase of $9.7 million, or 47%. This increase was primarily attributable to interest expense related to the settlement of the 2022 notes and an additional make-whole premium payment of approximately $20.1 million.

Gain on deconsolidation

We deconsolidated Silver Creek from our financial statements in the third quarter of 2017 on July 13, 2017, the date we were no longer the primary beneficiary of Silver Creek, in accordance with ASC 810-10-40-4(c), *Consolidation*. As a result, we recorded a gain on the deconsolidation of Silver Creek of $10.8 million for the three and nine months ended September 30, 2017 in our condensed consolidated statement of operations and comprehensive income (loss).

Income tax benefit (expense)

For the nine months ended September 30, 2017, we recognized an income tax benefit within continuing operations of $32.4 million and tax expense in discontinued operations of $47.0 million related to taxable income generated during the nine months ended September 30, 2017 as a result of the asset sale. For the nine months ended September 30, 2016, we recognized an income tax benefit of $9.8 million in continuing operations and income tax expense of $9.8 million in discontinued operations.

Discontinued operations

For the nine months ended September 30, 2017, we recognized income from discontinued operations, net of tax, of $548.0 million, as a result of the net gain on the asset sale. For the nine months ended September 30, 2016, we recognized a loss from discontinued operations, net of tax, of approximately $3.7 million.

Liquidity and Capital Resources

Sources of liquidity

We have financed our operations to date primarily through private placements of our convertible preferred stock, collaborations, public offerings of our securities, secured debt financings, sales of ONIVYDE and the asset sale of ONIVYDE. Through September 30, 2017, we have received $575.0 million from the asset sale of ONIVYDE, $268.2 million from the sale of convertible preferred stock and warrants, $126.7 million of net proceeds from the sale of common stock in our initial public offering and July 2013 follow-on underwritten public offering, $38.6 million of net proceeds from our 2015 “at the market offering” program, or the ATM offering, $39.6 million of net proceeds from a secured debt financing, $120.6 million of net proceeds from the issuance of the convertible notes in our July 2013 underwritten public offering, $168.5 million of net proceeds from the issuance of the 2022 notes, $487.6 million of upfront license fees, milestone payments, reimbursement of research and development costs and manufacturing services and other payments from our collaborations and $68.9 million of cash receipts related to ONIVYDE sales. We also entered into an arrangement to use our manufacturing capabilities to manufacture drug product on behalf of Actavis, for which we have

received $4.9 million in upfront fees and reimbursements as of September 30, 2017. In connection with the asset sale on April 3, 2017, we no longer will receive cash receipts related to ONIVYDE sales or upfront fees and reimbursements related to any manufacturing arrangement, as all rights to receive cash from these activities have been assigned to Ipsen. As of September 30, 2017, we had unrestricted cash and cash equivalents and marketable securities of $107.2 million.

Cash flows

The following table provides information regarding our cash flows for the nine months ended September 30, 2017 and 2016:

	Nine Months Ended September 30,	
(in thousands)	**2017**	**2016**
Net cash used in operating activities	$ (121,145)	$ (139,344)
Net cash provided by (used in) investing activities	511,355	(14,970)
Net cash provided by (used in) financing activities	(304,489)	5,171
Net increase (decrease) in cash and cash equivalents	$ 85,721	$ (149,143)

Operating activities

Cash used in operating activities was $121.1 million during the nine months ended September 30, 2017, of which $83.1 million was used by continuing operations and $38.0 million was used by discontinued operations. The cash used in operating activities was primarily a result of our $64.2 million net loss from continuing operations and changes in assets and liabilities of $7.8 million. The net change in operating assets and liabilities during the nine months ended September 30, 2017 was primarily driven by the increase in accounts receivable related to the working capital adjustment and decrease in accounts payable. This increase was offset by non-cash items, including $11.1 million of stock-based compensation expense, $3.4 million in non-cash interest expense, $32.4 million income tax benefit, $10.2 million of non-cash activity related to discontinued operations, and a $4.9 million loss on extinguishment. Cash used in operating activities of $139.3 million during the nine months ended September 30, 2016, of which $86.8 million was used by continuing operations and $52.5 million was used by discontinued operations, was primarily a result of our net loss from continuing operations of $116.2 million and a net decrease in operating assets and liabilities of $2.5 million. The net decrease in operating assets and liabilities during the nine months ended September 30, 2016 was primarily driven by decreases in accounts payable and accrued expenses. These decreases were offset by $31.9 million of non-cash items, including $8.3 million of stock-based compensation expense and $14.6 million of non-cash loss on extinguishment of convertible notes.

Investing activities

Cash provided by investing activities of $511.4 million during the nine months ended September 30, 2017 was primarily due to cash received from the sale of the commercial business of $575.0 million, offset by $60.0 million transferred to restricted cash. Cash used in investing activities of $15.0 million during the nine months ended September 30, 2016 was primarily due to purchases of marketable securities of $84.3 million in addition to $2.9 million of property and equipment purchases. The cash used in investing activities was offset by proceeds from maturities of available for sale securities of $72.2 million.

Financing activities

Cash used in financing activities of $304.5 million during the nine months ended September 30, 2017 was primarily due to the $175.0 million used to settle the principle balance of the 2022 notes and the $140.0 million dividend paid. Cash provided by financing activities of $5.2 million during the nine months ended September 30, 2016 was due to proceeds received from the exercise of stock options.

Borrowings and other liabilities

In December 2015, we closed a private placement of $175.0 million aggregate principal amount of 2022 notes. The 2022 notes bore interest at a rate of 11.50% per year, payable semi-annually on June 15 and December 15 of each year, beginning on June 15, 2016. In connection with the completion of the asset sale, on April 3, 2017, we irrevocably deposited the aggregate redemption price of the 2022 notes of 111.5% of the principal amount, plus accrued and unpaid interest of $7.4 million, with the trustee and irrevocably instructed the trustee to apply such amount to the redemption in full of the 2022 notes on the redemption date of April 27, 2017. The indenture was satisfied and discharged on April 3, 2017.

In July 2013, we issued convertible notes in the aggregate principal amount of $125.0 million. The convertible notes are convertible into common stock upon satisfaction of certain conditions. The convertible notes bear interest at a fixed rate of 4.50% per year, payable semiannually in arrears on January 15 and July 15 of each year. The convertible notes will mature on July 15, 2020

unless earlier repurchased by us or converted at the option of holders. On April 13, 2016, we entered into conversion agreements with certain holders of our convertible notes. Under the conversion agreements, such holders agreed to convert an aggregate principal amount of $64.2 million of convertible notes held by them. In connection with a lawsuit filed by the trustee and certain holders of the Convertible Notes in the Court of Chancery in the State of Delaware, captioned *Wells Fargo Bank, National Association, Wolverine Flagship Fund Trading Limited, Highbridge International LLC, and Highbridge Tactical Credit & Convertibles Master Fund, L.P. v. Merrimack Pharmaceuticals, Inc.*, or the Delaware Action, in April 2017, we deposited $60.0 million in proceeds from the asset sale into an escrow account to provide security to the plaintiffs for their claims in the Delaware Action.

On October 6, 2017, we entered into a settlement agreement, or the settlement agreement, to resolve the Delaware Action. In accordance with the settlement agreement, we paid $32.5 million in cash to the noteholder plaintiffs, which represents $0.90 per each $1.00 of convertible notes held by the noteholder plaintiffs, plus accrued and unpaid interest on the convertible notes held by the noteholder plaintiffs through October 2, 2017. The noteholder plaintiffs collectively held approximately $35.8 million aggregate principal amount of the convertible notes. In addition, we paid a total of $3.8 million in attorneys' fees and expenses to the plaintiffs' attorneys. The noteholder plaintiffs have executed a full release in favor of us for any claims arising out of or related to the Delaware Action or the convertible notes, which release shall become effective upon the occurrence of certain conditions. We paid such settlement amounts on or about October 11, 2017.

On October 13, 2017, in connection with the entry into the settlement agreement, we commenced a cash tender offer, or the tender offer, to purchase any and all of our remaining $25.0 million aggregate principal amount of outstanding convertible notes, or the remaining notes. Upon the terms and subject to the conditions set forth in our Offer to Purchase, dated October 13, 2017, and the related Letter of Transmittal, we are offering to pay, in cash, an amount equal to $900 per $1,000 principal amount of convertible notes purchased, plus accrued and unpaid interest to, but not including, the date of purchase. The tender offer will expire on November 10, 2017, or any other date and time to which we extend such tender offer, unless earlier terminated. See Note 10, "Borrowings," and Note 14, "Subsequent Events," in the accompanying notes to the condensed consolidated financial statements for additional information related to the convertible notes, the settlement agreement and the tender offer.

As a result of the amount that we paid pursuant to the settlement agreement, the amount that we expect to pay to acquire the remaining notes and other costs and expenses incurred related to the Delaware Action, we will have exhausted the full amount of the escrow funds and do not intend to declare an additional special dividend with respect to any portion of the escrow funds.

Funding requirements

We have incurred significant expenses and operating losses to date, and we expect to continue to incur significant expenses and operating losses for at least the next several years. We anticipate that we will continue to incur significant expenses as we:

- initiate or continue clinical trials of our most advanced product candidates;
- continue the research and development of our other product candidates;
- seek to discover additional product candidates;
- seek regulatory approvals for our product candidates that successfully complete clinical trials; and
- continue to provide the operational, financial and management information systems and personnel to support our product development.

We believe that at our currently forecasted spending rates, our existing financial resources, together with the net milestone payments we expect to receive under the Baxalta agreement, assuming certain milestones under such agreement are met, will be sufficient to fund our planned operations into the second half of 2019. We have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates, and the extent to which we utilize collaborations with third parties to participate in their development and commercialization, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical trials. Our future capital requirements will depend on many factors, including:

- the progress and results of the clinical trials of our most advanced product candidates;
- our ability to establish and maintain additional collaborations on favorable terms, and the success of any such future collaborations;
- the timing and amount of potential milestone payments related to ONIVYDE that we may receive from Ipsen and Baxalta;

- the scope, progress, results and costs of preclinical development, laboratory testing and clinical trials for our other product candidates;
- the costs, timing and outcome of regulatory review of our current and future product candidates;
- the costs of preparing, filing and prosecuting patent applications and maintaining, enforcing and defending intellectual property-related claims; and
- the extent to which we acquire or invest in businesses, products and technologies.

Until such time, if ever, as we can generate sufficient product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, licensing arrangements and other marketing and distribution arrangements. We also could engage in discussions with third parties regarding partnerships, joint ventures, combinations or divestitures of one or more of our businesses as we seek to further the development of our research programs, improve our cash position and maximize stockholder value. There can be no assurance as to the timing, terms or consummation of any financing, collaboration, licensing arrangement or other marketing and distribution arrangement, partnership, joint venture, combination or divestiture. We do not have any committed external sources of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our stockholders. 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 or declaring dividends. For example, if we raise additional funds through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Contractual Obligations and Commitments

Our contractual obligations and commitments were reported in our Annual Report on Form 10-K for the year ended December 31, 2016, which was filed with the SEC on March 1, 2017.

As described more fully in Note 3, “Sale of Commercial Business,” in connection with the completion of the asset sale, on April 3, 2017, we assigned to Ipsen all of our contracts relating to the commercial business, including our contracts with Baxalta, Actavis and PharmaEngine. Additionally, in connection with the completion of the asset sale, on April 3, 2017, we entered into a sublease with Ipsen pursuant to which Ipsen subleases from us approximately 70,237 square feet of leased space in our Cambridge, Massachusetts facility through the end of the term of the lease on June 30, 2019. Also, in connection with the completion of the asset sale, on April 3, 2017, we irrevocably deposited the redemption price of the 2022 notes of $175.0 million outstanding aggregate principal amount, interest through the redemption date and an additional make-whole premium payment of approximately $20.1 million with U.S. Bank National Association as trustee under the indenture and irrevocably instructed the trustee to apply such amount to the redemption in full of the 2022 notes on the redemption date of April 27, 2017. The indenture was satisfied and discharged on April 3, 2017.

On April 3, 2017, we entered into an amendment to our facility lease pursuant to which the final date of the term for approximately 29,157 square feet of leased space at our current facility in Cambridge, Massachusetts was reduced from June 30, 2019 to May 15, 2018 or earlier upon the landlord’s election. As a result of this amendment, our lease payments through 2019 will be reduced by approximately $1.7 million. On June 9, 2017, we entered into a further amendment to our facility lease pursuant to which we terminated the lease on approximately 25,735 square feet of leased space at our current facility in Cambridge, Massachusetts as of June 23, 2017. As a result of this amendment, our lease payments through 2019 will be reduced by approximately $4.4 million in the aggregate.

There have been no other material changes from the contractual obligations and commitments previously disclosed in our Annual Report on Form 10-K.

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 SEC rules.

Recent Accounting Pronouncements

See Note 13, "Recent Accounting Pronouncements," in the accompanying notes to the condensed consolidated financial statements for a full description of recent accounting pronouncements.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

We invest in a variety of financial instruments, principally cash deposits, money market funds, securities issued by the U.S. government and its agencies and corporate debt securities. The goals of our investment policy are preservation of capital, fulfillment of liquidity needs and fiduciary control of cash and investments. We also seek to maximize income from our investments without assuming significant risk.

Our primary exposure to market risk is interest income sensitivity, which is affected by changes in the general level of interest rates, particularly because our investments are in short-term marketable securities. Due to the short-term duration of our investment portfolio and the low risk profile of our investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our portfolio. We have the ability and intention to hold our investments 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 sudden change in market interest rates on our investment portfolio.

We do not currently have any auction rate or mortgage-backed securities. We do not believe our cash, cash equivalents and marketable securities have significant risk of default or illiquidity, however we cannot provide absolute assurance that in the future our investments will not be subject to adverse changes in market value.

The convertible notes bear interest at a fixed rate of 4.50% per year, payable semi-annually in arrears on January 15 and July 15 of each year, beginning on January 15, 2014. As a result, we are not subject to interest rate risk with respect to the convertible notes.

Item 4. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer (our principal executive officer and principal financial officer, respectively), evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2017. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. 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. Based on the evaluation of our disclosure controls and procedures as of September 30, 2017, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control Over Financial Reporting

No change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the three months ended September 30, 2017 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II

OTHER INFORMATION

Item 1. Legal Proceedings.

On March 15, 2017, the trustee and certain holders of our convertible notes filed the Delaware Action in the Court of Chancery in the State of Delaware. The Delaware Action complaint alleged that the sale of the commercial business to Ipsen was a sale of "substantially all" of our assets and therefore constituted a Fundamental Change (as defined in the indenture governing the convertible notes) as of the closing of the asset sale, which would trigger (a) certain obligations under the indenture governing the convertible notes, including an offer to repurchase the convertible notes, and (b) an event of default if Ipsen does not assume the obligations under the indenture and execute a supplemental indenture with respect to the convertible notes. In connection with plaintiffs' withdrawal of a motion for a preliminary injunction, in April 2017, we deposited into an escrow account $60.0 million in proceeds from the asset sale. On October 6, 2017, we entered into the settlement agreement to resolve the Delaware Action. In accordance with the settlement agreement, we paid $32.5 million in cash to the noteholder plaintiffs, which represents $0.90 per each $1.00 of convertible notes held by the noteholder plaintiffs, plus accrued and unpaid interest on the convertible notes held by the noteholder plaintiffs through October 2, 2017. The noteholder plaintiffs collectively held approximately $35.8 million aggregate principal amount of the convertible notes. In addition, we paid a total of $3.8 million in attorneys' fees and expenses to the plaintiffs' attorneys. The noteholder plaintiffs have executed a full release in favor of us for any claims arising out of or related to the Delaware Action or the convertible notes, which release shall become effective upon the occurrence of certain conditions.

On February 28, 2017, a putative stockholder class action suit was filed by a purported stockholder of ours in the Superior Court of Massachusetts for the County of Middlesex against us and our directors. The case was captioned *Robert Garfield v. Merrimack Pharmaceuticals Inc., et al.*, or the Garfield Action. The Garfield Action complaint alleged that our directors breached their fiduciary duties by entering into the asset sale agreement with Ipsen and that the definitive proxy statement relating to the asset sale contained inadequate disclosures and omissions. Although we believed that the Garfield Action was without merit, to avoid the risk of the litigation delaying or adversely affecting the asset sale and to minimize the expense of defending the litigation related to the asset sale, we agreed to make supplemental disclosures related to the asset sale and to pay the plaintiff's counsel $375,000 in attorney's fees in connection with the resolution of the Garfield Action. As a result, the Garfield Action was dismissed with prejudice.

We are not currently a party to any other material legal proceedings.

Item 1A. Risk Factors.

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 presently deem less significant may also impair our business operations. Please see page 1 of this Quarterly Report on Form 10-Q for a discussion of some of the forward-looking statements 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 the Sale of our Commercial Business to Ipsen

Because the commercial business represented all of our revenues for fiscal year 2016 and the three months ended March 31, 2017, our business following the sale of the commercial business is substantially different than it was prior to such sale.

As a result of the completion of our previously announced asset sale with Ipsen, Ipsen acquired, pursuant to the asset sale agreement, our right, title and interest in the commercial business. The commercial business represented all of our revenues for the fiscal year 2016 and the three months ended March 31, 2017. Following the sale of the commercial business, we retained our pipeline business. Our results of operations and financial condition may be materially affected if we fail to grow our pipeline business, if we are unable to raise additional capital if needed to run the pipeline business, if we must incur significant costs in order to raise additional capital to run the pipeline business or if we are unable to successfully develop and commercialize our remaining product candidates.

We are, and in the future may be, subject to securities litigation, which is expensive and could divert our attention.

As discussed below, we are, and may in the future be, subject to securities class action litigation in connection with the asset sale. Securities litigation against us could result in substantial costs and divert our management's attention, which could seriously harm our business. For instance, the Garfield Action was filed by a purported stockholder in the Superior Court of Massachusetts for the County of Middlesex against us and our directors. The case is captioned *Robert Garfield v. Merrimack Pharmaceuticals Inc., et al*. The Garfield Action complaint alleged that our directors breached their fiduciary duties by entering into the asset sale agreement and that the definitive proxy statement relating to the asset sale contained inadequate disclosures and omissions. Although we believed that the Garfield Action was without merit, to avoid the risk of the litigation delaying or adversely affecting the asset sale and to minimize the expense of defending the litigation related to the asset sale, we agreed to make supplemental disclosures related to the asset sale and to pay the plaintiff's counsel $375,000 in attorney's fees in connection with the resolution of the Garfield Action. As a result, the plaintiff concluded that the claims in the Garfield Action have been mooted, and the Garfield Action was dismissed with prejudice. Nonetheless, there can be no guarantee that there will not be additional securities class action litigation in connection with the asset sale.

There can be no guarantee that Ipsen will comply with its obligation to use commercially reasonable efforts in connection with the development of ONIVYDE or that the milestones set forth in the Baxalta agreement will be achieved.

Ipsen has agreed to use commercially reasonable efforts to develop ONIVYDE in connection with obtaining the regulatory approval by the FDA of ONIVYDE for certain indications. Although the results of this approval process may enable Ipsen to achieve the milestones necessary for us to receive the contingent payments under the asset sale agreement, there is no guarantee that Ipsen will take the steps set forth in the asset sale agreement and that such development will lead to the successful approval of ONIVYDE for such additional indications. Therefore, there can be no guarantees that any of the milestones set forth in the asset sale agreement will be achieved and that we will receive any future contingent payments.

Additionally, although the asset sale agreement entitles us to receive certain net milestone payments of up to $33.0 million that may become payable under the Baxalta agreement, achievement of such milestones and payment of any or all of the $33.0 million is not guaranteed.

Ipsen is not assuming any of the excluded liabilities under the asset sale agreement.

Pursuant to the asset sale agreement, Ipsen assumed only certain specified liabilities set forth in the asset sale agreement and did not assume all of the liabilities associated with the commercial business. Certain liabilities remain with us post-closing. While we believe that we have adequately accrued for these liabilities or are adequately insured against certain of the risks associated with such excluded liabilities, there can be no assurances that additional expenditures will not be incurred in resolving any such liabilities.

The asset sale agreement may expose us to contingent liabilities.

We have agreed to indemnify Ipsen for certain breaches of representations, warranties or covenants made by us in the asset sale agreement and for certain specified existing litigation. We have agreed that if we cannot pay our indemnification obligations, Ipsen will have set-off rights against any future contingent payments. Significant indemnification claims by Ipsen could further materially and adversely affect our financial condition and/or significantly reduce any future contingent payments.

Risks Related to Our Financial Position and Need for Additional Capital

We have incurred significant losses since our inception. We expect to incur operating losses for the foreseeable future and may never achieve or maintain profitability.

Since inception, we have incurred significant operating losses. Our net loss from continuing operations before income tax benefit was $96.5 million for the nine months ended September 30, 2017. Our net loss was $153.5 million for the year ended December 31, 2016, $147.8 million for the year ended December 31, 2015 and $83.6 million for the year ended December 31, 2014. As of September 30, 2017, we had an accumulated deficit of $469.8 million. To date, we have financed our operations primarily through private placements of our convertible preferred stock, collaborations, public offerings of our securities, secured debt financings, sales of ONIVYDE and the asset sale of ONIVYDE. We have devoted substantially all of our efforts to research and development, including clinical trials and recently to commercialization of our first product, ONIVYDE, which was sold to Ipsen. We have not completed development of or commercialized any other therapeutic product candidates or diagnostics other than ONIVYDE. We expect to continue to incur significant expenses and increasing operating losses for at least the next several years. We anticipate that our expenses will increase substantially as we:

- initiate or continue clinical trials of our most advanced product candidates;
- continue the research and development of our other product candidates;
- seek to discover additional product candidates;
- seek regulatory approvals for our product candidates that successfully complete clinical trials; and
- continue to provide the operational, financial and management information systems and personnel to support our product development.

To become and remain profitable, we must succeed in developing and commercializing products with significant market potential. This will require us to be successful in a range of challenging activities, including discovering product candidates, completing preclinical testing and clinical trials of our product candidates, obtaining regulatory approval for these product candidates and manufacturing, marketing and selling or partnering those products for which we may seek and receive regulatory approval. We may never succeed in these activities and may never generate revenues that are significant or large enough to achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would depress the value of our company and could impair our ability to raise capital, expand our business, diversify our product offerings or continue our operations. A decline in the value of our company could also cause our stockholders to lose all or part of their investment.

Our substantial indebtedness may limit cash flow available to invest in the ongoing needs of our business.

We currently have, and will continue to have, a significant amount of indebtedness. In July 2013, we issued $125.0 million aggregate principal amount of convertible notes, of which an aggregate principal amount of $60.8 million remained outstanding as of September 30, 2017. In December 2015, we issued $175.0 million aggregate principal amount of 11.50% senior secured notes due 2022, or 2022 notes. Although we used a portion of the proceeds from the asset sale to extinguish the 2022 notes, and although we extinguished approximately $35.8 million aggregate principal amount of the convertible notes in connection with the settlement agreement and have commenced the tender offer to purchase the remaining notes, we could in the future incur additional indebtedness.

Our substantial debt combined with our other financial obligations and contractual commitments could have significant adverse consequences, including:

- requiring us to dedicate a substantial portion of cash flow from operations to the payment of interest on, and principal of, our debt, which will reduce the amounts available to fund working capital, capital expenditures, product development efforts and other general corporate purposes;
- increasing our vulnerability to adverse changes in general economic, industry and market conditions;

- obligating us to restrictive covenants that may reduce our ability to take certain corporate actions or obtain further debt or equity financing;
- limiting our flexibility in planning for, or reacting to, changes in our business and the industry in which we compete; and
- placing us at a competitive disadvantage compared to our competitors that have less debt or better debt servicing options.

We intend to satisfy our current and future debt service obligations with our existing cash and cash equivalents and funds from external sources. However, we may not have sufficient funds or may be unable to arrange for additional financing to pay any amounts due under our debt as it exists at any future point in time. Funds from external sources may not be available on acceptable terms, if at all. In addition, a failure to comply with the covenants under our existing debt instruments could result in an event of default under those instruments. In the event of an acceleration of amounts due under our debt instruments as a result of an event of default, including upon the occurrence of an event that would reasonably be expected to have a material adverse effect on our business, operations, properties, assets or condition or a failure to pay any amount due, we may not have sufficient funds or may be unable to arrange for additional financing to repay our indebtedness or to make any accelerated payments, and the lenders could seek to enforce security interests in the collateral securing such indebtedness. In addition, the covenants under our existing debt instruments and the pledge of our assets as collateral limit our ability to obtain additional debt financing.

Servicing our debt requires a significant amount of cash, and we may not have sufficient cash flow from our business to pay our obligations.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance our indebtedness depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. We currently do not generate cash flow from operations and, in the future, our business may not generate cash flow from operations sufficient to service our debt and make necessary capital expenditures. If we are unable to generate cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt or obtaining additional equity or debt financing on terms that may be unfavorable to us or highly dilutive. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities at all or engage in these activities on desirable terms, which could result in a default on our debt obligations or future indebtedness.

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

We will need substantial additional funding in connection with our continuing operations. We expect to continue to incur significant research and development expenses in connection with our ongoing activities, particularly as we continue the research, development and clinical trials of, and seek regulatory approval for, our product candidates. If we are unable to raise capital when needed or on attractive terms, we would be forced to delay, reduce or eliminate our research and development programs or commercialization efforts.

Upon the closing of the asset sale with Ipsen, which occurred on April 3, 2017, we received a $575.0 million upfront cash payment from Ipsen, subject to the working capital adjustment. We used these proceeds to redeem the 2022 notes, including payment of the $175.0 million outstanding aggregate principal amount, interest through the redemption date and an additional make-whole premium payment of approximately $20.1 million, and our board of directors declared a special cash dividend of $140.0 million, which was payable on May 26, 2017 to stockholders of record as of the close of business on May 17, 2017. Additionally, if certain milestones under the Baxalta agreement are met, we currently expect to receive up to an aggregate of $33.0 million in net milestone payments in 2017. We believe that at our currently forecasted spending rates, our existing financial resources, together with the net milestone payments we expect to receive under the Baxalta agreement, assuming certain milestones under such agreement are met, will be sufficient to fund our planned operations into the second half of 2019. We have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates, and the extent to which we utilize collaborations with third parties to participate in their development and commercialization, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical trials. Our future capital requirements will depend on many factors, including:

- the progress and results of the clinical trials of our most advanced product candidates;
- our ability to establish and maintain additional collaborations on favorable terms, and the success of any such future collaborations;
- the timing and amount of potential milestone payments related to ONIVYDE that we may receive from Ipsen and Baxalta;

- the scope, progress, results and costs of preclinical development, laboratory testing and clinical trials for our product candidates;
- the costs, timing and outcome of regulatory review of our current and future product candidates;
- the costs of preparing, filing and prosecuting patent applications and maintaining, enforcing and defending intellectual property-related claims; and
- the extent to which we acquire or invest in businesses, products and technologies.

Conducting preclinical testing and clinical trials is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data required to obtain regulatory approval and, even if regulatory approval is obtained, achieve product sales of any of our product candidates. In addition, any of our product candidates, even if approved, may not achieve commercial success. If we fail to generate sufficient revenues from collaborations or the commercialization of any of our product candidates, we will need to continue to rely on additional financing to achieve our business objectives.

Our independent registered public accounting firm included an explanatory paragraph relating to our ability to continue as a going concern in its report on our audited financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2016.

The report from our independent registered public accounting firm for the year ended December 31, 2016 includes an explanatory paragraph stating that our losses from operations and required additional funding to finance our operations raise substantial doubt about our ability to continue as a going concern. If we are unable to obtain sufficient funding, our business, prospects, financial condition and results of operations will be materially and adversely affected and we may be unable to continue as a going concern. If we are unable to continue as a going concern, we may have to liquidate our assets and may receive less than the value at which those assets are carried on our audited financial statements, and it is likely that investors will lose all or a part of their investment. If we seek additional financing to fund our business activities in the future and there remains substantial doubt about our ability to continue as a going concern, investors or other financing sources may be unwilling to provide additional funding to us on commercially reasonable terms or at all.

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

We do not have any committed external source of funds. Sources of funds may not be available or, if available, may not be available on terms satisfactory to us and could result in significant stockholder dilution.

Until such time, if ever, as we can generate sufficient product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, licensing arrangements and other marketing and distribution arrangements. We also could engage in discussions with third parties regarding partnerships, joint ventures, combinations or divestitures of one or more of our businesses as we seek to further the development of our research programs, improve our cash position and maximize stockholder value. There can be no assurance as to the timing, terms or consummation of any financing, collaboration, licensing arrangement or other marketing and distribution arrangement, partnership, joint venture, combination or divestiture.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our existing common stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our stockholders. Additional 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 or declaring dividends, and these covenants may also require us to attain certain levels of financial performance and we may not be able to do so; any such failure may result in the acceleration of such debt and the foreclosure by our creditors on the collateral we used to secure the debt. The debt issued in a debt financing would also be senior to our outstanding shares of capital stock, and may rank equally with or senior to the convertible notes, upon our liquidation. Our existing indebtedness and the pledge of our assets as collateral limit our ability to obtain additional debt financing. If we raise additional funds through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Our investments are subject to risks that could result in losses.

We have invested and plan to continue to invest our cash in a variety of financial instruments, principally securities issued by the U.S. government and its agencies, investment grade corporate bonds, including commercial paper, and money market instruments. All of these investments are subject to credit, liquidity, market and interest rate risk. Such risks, including the failure or severe financial distress of the financial institutions that hold our cash, cash equivalents and investments, may result in a loss of liquidity, impairment to our investments, realization of substantial future losses, or a complete loss of the investments in the long-term, which may have a material adverse effect on our business, results of operations, liquidity and financial condition. In order to manage the risk to our investments, we maintain an investment policy that, among other things, limits the amount that we may invest in any one issue or any single issuer and requires us to only invest in high credit quality securities, but there can be no guarantee that our investments will not result in losses.

Risks Related to the Development and Commercialization of Our Product Candidates

We depend heavily on the success of our clinical stage product candidates. All of our product candidates are in preclinical and clinical development. Clinical trials of our product candidates may not be successful. If we are unable to successfully commercialize our product candidates, or experience significant delays in doing so, our business will be materially harmed.

We invest a significant portion of our efforts and financial resources in the development of our clinical stage product candidates for the treatment of various types of cancer. All of our product candidates are still in preclinical and clinical development. Our ability to generate meaningful product revenues will depend heavily on the successful development of our product candidates. The success of our product candidates, which include both our therapeutic product candidates and diagnostic candidates, will depend on several factors, including the following:

- successful enrollment in, and completion of, preclinical studies and clinical trials;
- receipt of marketing approvals from the FDA and similar regulatory authorities outside the United States for our product candidates, including our diagnostics;
- establishing commercial manufacturing capabilities, which we anticipate doing primarily through arrangements with third-party manufacturers;
- launching commercial sales of any approved products, whether alone or in collaboration with others;
- acceptance of any approved products by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- a continued acceptable safety profile of any products following approval; and
- qualifying for, maintaining, enforcing and defending intellectual property rights and claims.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully develop our product candidates, which would materially harm our business.

For example, in connection with our strategic review of our pipeline which was completed in January 2017, we amended several of our clinical trials such as our Phase 2 clinical trial of MM-121 and our Phase 2 clinical trial of MM-141, resulting in changes to their power, design and timing, and also discontinued several trials, including our Phase 2 clinical trial of MM-302.

If clinical trials of our product candidates fail to demonstrate safety and efficacy to the satisfaction of the FDA or similar regulatory authorities outside the United States or do not otherwise produce positive results, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.

We may never receive approval to commercialize our product candidates in the United States or other jurisdictions. Before obtaining regulatory approval for the sale of our product candidates, we must conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. A failure of one or more of our clinical trials can occur at any stage of testing. The outcome of preclinical testing and early clinical trials may not be predictive of the success of later clinical trials, and successful interim results of a clinical trial do not necessarily predict successful final results.

We may experience numerous unexpected events during, or as a result of, clinical trials that could delay or prevent our ability to receive regulatory approval or commercialize our product candidates, including:

- regulators or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- clinical trials of our product candidates may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate, enrollment in these clinical trials may be insufficient or slower than we anticipate or patients may drop out of these clinical trials at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- we might have to suspend or terminate clinical trials of our product candidates for various reasons, including a finding of a lack of clinical response or a finding that the patients are being exposed to unacceptable health risks;
- regulators or institutional review boards may require that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements;
- the cost of clinical trials of our product candidates may be greater than we anticipate;
- the supply or quality of our product candidates, diagnostics or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate or prohibitively expensive; and
- our product candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators to suspend or terminate the trials.

For example, in December 2016, we decided to discontinue our Phase 2 clinical trial of MM-302 in combination with trastuzumab in patients with ErbB2 (HER2) positive, locally advanced or metastatic breast cancer based on an opinion from the Data Safety Monitoring Board that continuing the clinical trial would be unlikely to demonstrate benefit over the comparator treatments. We do not plan to invest in additional development of MM-302 at this time.

Preclinical and clinical data may not be predictive of the success of later clinical trials, and are often susceptible to varying interpretations and analyses. Many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products.

If we are required to conduct additional clinical trials or other testing of our product candidates beyond those that we currently contemplate, if we are unable to successfully complete clinical trials of our product candidates or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications that are not as broad as intended;
- have the product removed from the market after obtaining marketing approval;
- be subject to additional post-marketing testing requirements;
- be subject to restrictions on how the product is distributed or used; or
- be unable to obtain reimbursement for use of the product.

Delays in testing or approvals may result in increases to our product development costs. We do not know whether any clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all.

Significant clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do and impair our ability to commercialize our product candidates and may harm our business and results of operations.

If serious adverse or undesirable side effects are identified during the development of our product candidates or following their approval and commercialization, we may need to modify or abandon our development or marketing of such product or product candidate.

All of our product candidates are still in preclinical or clinical development and their risk of failure is high. It is impossible to predict when or if any of our product candidates will prove effective or safe in humans or will receive regulatory approval, and it is impossible to ensure that safety or efficacy issues will not arise following regulatory approval. Currently marketed therapies for solid tumors are generally limited to some extent by their toxicity. Use of our product candidates as monotherapies in clinical trials also has resulted in adverse events consistent in nature with other marketed therapies. When used in combination with other marketed or investigational therapies, our product candidates may exacerbate adverse events associated with the other therapy. If our products or product candidates, either alone or in combination with other therapies, result in undesirable side effects or have characteristics that are unexpected, we may need to modify or abandon their development or marketing.

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

We may not be able to initiate or continue clinical trials for our product candidates if we are unable to locate and enroll a sufficient number of eligible patients to participate in these trials to obtain a statistically significant result as required by the FDA or other regulatory authorities. In addition, many of our competitors have ongoing clinical trials for product candidates that could be competitive with our product candidates. Patients who would otherwise be eligible for our clinical trials may instead enroll in clinical trials of our competitors' product candidates or rely upon treatment with existing therapies that may preclude them from eligibility for our clinical trials.

Enrollment delays in our clinical trials may result in increased development costs for our product candidates, which would cause the value of the company to decline and limit our ability to obtain additional financing. Our inability to enroll a sufficient number of patients for any of our current or future clinical trials would result in significant delays or may require us to abandon one or more clinical trials altogether.

In general, we forecast enrollment for our clinical trials based on experience from previous clinical trials and monitor enrollment to be able to make adjustments to clinical trials when appropriate, including as a result of slower than expected enrollment that we experience from time to time in our clinical trials. It is possible that slow enrollment could require us to make adjustments to our clinical trials. If these adjustments do not overcome problems with slow enrollment, we could experience significant delays or abandon the applicable clinical trial altogether.

If we are unable to successfully develop diagnostics for our therapeutic product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our therapeutics.

An important component of our business strategy is to develop, either alone or together with third parties, diagnostics for each of our therapeutic product candidates. There has been limited success to date industry-wide in developing diagnostics. To be successful, we will need to address a number of scientific, technical, regulatory and logistical challenges.

All of our diagnostic candidates are in preclinical or clinical development. We have limited experience in the development of diagnostics and may not be successful in developing appropriate diagnostics to pair with any of our therapeutic product candidates that receive marketing approval. The FDA and similar regulatory authorities outside the United States are generally expected to regulate *in vitro* companion diagnostics as medical devices and *in vivo* companion diagnostics as drugs. In each case, companion diagnostics require separate regulatory approval prior to commercialization. Given our limited experience in developing diagnostics, we expect to rely in part on third parties for their design, development and manufacture. If we, or any third parties that we engage to assist us, are unable to successfully develop diagnostics for our therapeutic product candidates, or experience delays in doing so, the development of our therapeutic product candidates may be adversely affected, our therapeutic product candidates may not receive marketing approval and we may not realize the full commercial potential of any therapeutics that receive marketing approval. As a result, our business would be harmed, possibly materially.

Any of our product candidates that receive regulatory approval may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

Even if any of our product candidates receive marketing approval, they may nonetheless not gain sufficient market acceptance by physicians, patients, healthcare payors and others in the medical community. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors that may be uncertain or subjective, including:

- the prevalence and severity of any side effects;
- efficacy and potential advantages or disadvantages compared to alternative treatments;
- the price we charge for our product candidates;
- convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- our ability to successfully develop diagnostics that effectively identify patient populations likely to benefit from treatment with our therapeutic products;
- the strength of marketing and distribution support; and
- sufficient third-party coverage or reimbursement.

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than we do.

The development and commercialization of new therapeutic and diagnostic products is highly competitive. We face competition with respect to our current product candidates, and will face competition with respect to any products that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. Several large pharmaceutical and biotechnology companies currently market and sell products for the treatment of the solid tumor indications for which we are developing our product candidates. Potential competitors also include academic institutions, government agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization. Many of these competitors are attempting to develop therapeutics for our target indications.

We are developing our product candidates for the treatment of solid tumors. There are a variety of available therapies marketed for solid tumors. In many cases, these drugs are administered in combination to enhance efficacy. Some of these drugs are branded and subject to patent protection, and others are available on a generic basis. Many of these approved drugs are well established therapies and are widely accepted by physicians, patients and third-party payors. This may make it difficult for us to achieve our business strategy of replacing existing therapies with our product candidates.

There are also a number of products in late stage clinical development to treat solid tumors. Our competitors may develop products that are more effective, safer, more convenient or less costly than any that we are developing or that would render our product candidates obsolete or non-competitive. Our competitors may also obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours. In addition, our ability to compete may be affected because in many cases insurers or other third-party payors seek to encourage the use of generic products. There are many generic products currently on the market for the indications that we are pursuing, and additional products are expected to become available on a generic basis over the coming years.

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

Even if we are able to commercialize any of our product candidates, those product candidates may become subject to unfavorable pricing regulations, third-party reimbursement practices or healthcare reform initiatives, which could harm our business.

The regulations that govern marketing approvals, pricing and reimbursement for new therapeutic and diagnostic products vary widely from country to country. Some countries require approval of the sale price of a product before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain regulatory approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product and negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain regulatory approval.

Our ability to commercialize any approved products successfully also will depend in part on the extent to which coverage and reimbursement for these products and related treatments will be available from third-party payors, including government payors such as Medicare and Medicaid, private health insurers and managed care organizations. There have been, and we expect there will continue to be, legislative and regulatory proposals to change the healthcare system in ways that could impact our ability to sell our products profitably. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. The federal government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid healthcare costs, including price controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. Adoption of such controls and measures, and tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceuticals and the other product candidates that we are developing and could have a material adverse effect our net revenue and results.

Third-party payors decide which drugs they will pay for and establish reimbursement and co-pay levels. The growing emphasis on managed care in the United States has increased and we expect will continue to increase the pressure on drug pricing. Third-party payors are increasingly challenging the prices charged for medical products and services and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. If these third-party payors do not consider our products to be cost-effective compared to other available therapies, they may not cover our products after approval as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow us to sell our products at a profit. In order to secure coverage and reimbursement for any product that might be approved for sale, we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costs required to obtain FDA or other comparable regulatory approvals. Even with clinical trials, our product candidates may be considered less safe, less effective or less cost-effective than other products, and third-party payors may not provide coverage and reimbursement for our products or any of our product candidates that we commercialize, in whole or in part.

The process for determining whether a payor will provide coverage for a drug product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the drug product once coverage is approved. Third-party payors may limit coverage to specific drug products on a formulary, which might not include all of the approved drugs for a particular indication, and a payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved.

We cannot be sure that reimbursement will be available for any product that we commercialize and, if reimbursement is available, what the level of reimbursement will be. Reimbursement may impact the demand for, or the price of, any product for which we obtain marketing approval. Third-party reimbursement may not be sufficient to enable us to maintain price levels high enough to realize an appropriate return on our investment in product development. Obtaining reimbursement for our products may be particularly difficult because of the higher prices often associated with products administered under the supervision of a physician. In addition, coverage policies, third-party reimbursement rates and drug pricing regulation may change at any time. Thus, even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future. The marketability of any products for which we receive regulatory approval for commercial sale may also suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. If reimbursement is not available or is available only to limited levels, we may not be able to successfully commercialize any product candidate that we successfully develop.

Payors also are increasingly considering new metrics as the basis for reimbursement rates, such as average sales price, average manufacturer price and actual acquisition cost. The existing data for reimbursement based on these metrics is relatively limited, although certain states have begun to survey acquisition cost data for the purpose of setting Medicaid reimbursement rates. Centers for Medicare & Medicaid Services, or CMS, surveys and publishes retail community pharmacy acquisition cost information in the National Average Drug Acquisition Cost files to provide state Medicaid agencies with a basis of comparison for their own reimbursement and pricing methodologies and rates.

Moreover, there may be significant delays in obtaining reimbursement for any approved products, and coverage may be more limited than the purposes for which the product is approved by the FDA or regulatory authorities in other countries. Eligibility for reimbursement does not imply that any product will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim payments for new products, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Payment rates may vary according to the use of the product and the clinical setting in which it is used, may be based on payments allowed for lower cost products that are already reimbursed, and may be incorporated into existing payments for other services. Net prices for products may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future weakening of laws that presently restrict imports of products from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our inability to promptly obtain coverage and appropriate payment rates from both government-funded and private payors for new products that we develop could therefore have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products, and our overall financial condition.

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

We face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and an even greater risk related to the commercial sale of any products that we may develop. If we cannot successfully defend ourselves against claims that any of our product candidates caused injuries, we will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for the products or product candidates that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of patients from clinical trials;
- significant costs to defend the related litigation;
- substantial monetary awards to patients;
- loss of revenue; and
- the inability to commercialize any products that we may develop.

We currently hold $10.0 million in product liability insurance coverage, which may not be adequate to cover all liabilities that we may incur. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any or every liability that may arise.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on research programs and product candidates for specific indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products.

We have based our research and development efforts on our systems biology approach to biomedical research. Notwithstanding our large investment to date and anticipated future expenditures in our proprietary approach to research and development, we may fail to address or develop product candidates or indications based on other scientific approaches that may offer greater commercial potential or for which there is a greater likelihood of success.

We also may not be successful in our efforts to identify or discover new or additional product candidates through our systems biology approach. Research programs to identify new product candidates require substantial technical, financial and human resources. These research programs may initially show promise in identifying potential product candidates, yet fail to yield product candidates for clinical development.

If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have otherwise been more advantageous for us to retain sole development and commercialization rights.

We may establish separately funded companies for the development of product candidates using our systems biology approach in some areas outside the oncology field. These companies may not be successful in the development and commercialization of any product candidates.

We may apply our systems biology approach to disease areas outside the oncology field, and could do so through the establishment of separately funded companies. For example, we established Silver Creek to research and develop regenerative medicines to repair the heart using our systems biology approach. Silver Creek has received separate funding from investors other than us and, as of the third quarter of 2017, we were no longer the majority owner of Silver Creek. To the extent we are not the majority owner of or control Silver Creek or other companies that we establish, Silver Creek or such other companies could take actions that we do not endorse or with which we disagree, such as using our systems biology approach in a way that reflects adversely on us. In addition, these companies may have difficulty raising additional funds and could encounter any of the risks in developing and commercializing product candidates to which we are subject.

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

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and radioactive and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We also store certain low level radioactive waste at our facilities until the materials can be properly disposed of. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage, use or disposal of biological, hazardous or radioactive materials.

In addition, we may be required to incur substantial costs to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Fluctuations in foreign currency exchange rates could substantially increase the costs of our clinical trial programs.

A significant portion of our clinical trial activities are conducted outside of the United States, and associated costs may be incurred in the local currency of the country in which the trial is being conducted, which costs could be subject to fluctuations in foreign exchange rates. At present, we do not engage in hedging transactions to protect against uncertainty in future exchange rates between particular foreign currencies and the U.S. dollar. A decline in the value of the U.S. dollar against currencies in geographies in which we conduct clinical trials could have a negative impact on our research and development costs. We cannot predict the impact of foreign currency fluctuations, and foreign currency fluctuations in the future may adversely affect our development costs.

Risks Related to Our Dependence on Third Parties

We may depend on collaborations with third parties for the development and commercialization of our product candidates. If those collaborations are not successful, we may not be able to capitalize on the market potential of these product candidates.

Depending on our capital requirements, development and commercialization costs, need for additional therapeutic expertise and other factors, it is possible that we will enter into additional development and commercialization arrangements with respect to either oncology product candidates or product candidates in other therapeutic areas.

Our likely collaborators for any distribution, marketing, licensing or broader collaboration arrangements include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies and biotechnology companies. We will have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates. Our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates pose the following risks to us:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in their strategic focus or available funding, or external factors such as an acquisition that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive;
- a collaborator with marketing and distribution rights to one or more products may not commit sufficient resources to their marketing and distribution;
- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our proprietary information or expose us to potential litigation;
- disputes may arise between us and the collaborators that result in the delay or termination of the research, development or commercialization of our product candidates or that result in costly litigation or arbitration that diverts management attention and resources; and
- collaborations may be terminated, such as the termination of our license and collaboration agreement with Sanofi effective December 17, 2014, and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.

Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators. If a present or future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program could be delayed, diminished or terminated.

For instance, Ipsen has agreed to use commercially reasonable efforts to develop ONIVYDE in connection with obtaining the regulatory approval by the FDA of ONIVYDE for certain indications. Although the results of this approval process may enable Ipsen to achieve the milestones necessary for us to receive the contingent payments under the asset sale agreement, there is no guarantee that Ipsen will take the steps set forth in the asset sale agreement and that such development will lead to the successful approval of ONIVYDE for such additional indications. Therefore, there can be no guarantees that any of the milestones set forth in the asset sale agreement will be achieved and that we will receive any future contingent payments.

Additionally, although the asset sale agreement entitles us to receive certain net milestone payments of up to $33.0 million under the Baxalta agreement, achievement of such milestones and payment of any or all of the $33.0 million is not guaranteed.

If we are not able to establish additional collaborations, we may have to alter our development plans.

Our product development programs and the potential commercialization of any approved product candidates will require substantial additional cash to fund expenses. For some of our product candidates, we may decide to collaborate with pharmaceutical and biotechnology companies for the development and potential commercialization of those product candidates.

We face significant competition in seeking appropriate collaborators. Collaborations are complex and time-consuming to negotiate and document. We may also be restricted under existing collaboration agreements from entering into agreements on certain terms with other potential collaborators. We may not be able to negotiate collaborations on acceptable terms, or at all. If that were to occur, we may have to curtail the development of a particular product candidate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of our sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we will not be able to bring our product candidates to market and generate product revenue.

We rely on third parties to conduct our clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials.

We do not independently conduct clinical trials of our product candidates. We rely on third parties, such as contract research organizations, clinical data management organizations, medical institutions and clinical investigators, to perform this function. Our reliance on these third parties for clinical development activities reduces our control over these activities but does not relieve us of our responsibilities. We remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA and other international regulatory agencies require us to comply with standards, commonly referred to as good clinical practices, for conducting, recording and reporting the results of clinical trials to assure that adverse event data are reported within required timeframes, that data and reported results are credible and accurate and that the rights, integrity and confidentiality of patients in clinical trials are protected. Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, regulatory approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our product candidates.

We also rely on other third parties to store and distribute supplies for our clinical trials. Any performance failure on the part of our existing or future distributors could delay clinical development or regulatory approval of our product candidates or commercialization of our products or cause us to incur additional costs, producing additional losses and depriving us of potential product revenue.

We also intend to utilize diagnostics in several of our current and planned clinical trials, including current clinical trials of MM-121, MM-141 and MM-310, to preselect patients who will receive specified treatment regimens. We will rely on third-party laboratories to test patient samples in connection with such diagnostics. Any failure on the part of these laboratories to properly perform such testing could jeopardize those clinical trials and delay or prevent the approval of the associated therapeutic candidate.

Risks Related to the Manufacturing of Our Product Candidates

We rely on third parties for the production of our product candidates. This increases the risk that we will not have sufficient quantities of our product candidates at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We rely on third-party manufacturers for most of the aspects of the production of our product candidates, including the production of bulk drug substance and fill-finish and labeling activities. Reliance on third-party manufacturers entails risks, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party; and
- the possible termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us.

Third-party manufacturers may not be able to comply with current good manufacturing practices, or cGMP, or Quality System Regulation, or QSR, or similar regulatory requirements outside the United States. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our product candidates.

For instance, in 2010, a former fill-finish third-party contractor that we used to fill and package MM-121 experienced FDA inspection issues with its quality control processes that resulted in a formal warning letter from the FDA. As a result, we pulled some MM-121 from clinical trial sites and replaced it with MM-121 that was filled by a different contractor. This restocking resulted in a few patients missing one or two doses of MM-121. It is possible that we could experience similar issues with other contractors.

Furthermore, our products may compete with the products of other companies for access to manufacturing facilities. Because there are a limited number of manufacturers that operate under cGMP or QSR regulations and that might be capable of manufacturing for us at an appropriate scale, we may not have access to such manufacturers.

In connection with the asset sale, we entered into a transition services agreement with Ipsen, pursuant to which we and Ipsen are providing certain services to each other for a period of 24 months, including Ipsen’s agreement to manufacture MM-310 pursuant to a manufacturing services agreement. Although we are negotiating arrangements with other third parties for our other product candidates, we do not currently have any agreements with third-party manufacturers for the clinical supply to us of any product candidates, and we may be unable to conclude such agreements or to do so on acceptable terms.

We rely on certain single suppliers for certain materials that we use for the manufacture of our product candidates. We purchase these materials from our suppliers on a purchase order basis and do not have long-term supply agreements in place. Any performance failure or refusal to supply on the part of our existing or future suppliers could delay clinical development, marketing approval or commercialization of our products. If our current suppliers cannot perform as agreed, we may be required to replace one or more of these suppliers. Although we believe that there may be a number of potential long-term replacements to each supplier, we may incur added costs and delays in identifying and qualifying any such replacements.

We likely will rely upon third-party manufacturers to provide us with necessary reagents and instruments to develop, test and manufacture our *in vitro* diagnostics.

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

Risks Related to Our Intellectual Property

If we fail to fulfill our obligations under our intellectual property licenses with third parties, we could lose license rights that are important to our business.

We are a party to a number of intellectual property license agreements with third parties, including with respect to MM-121, MM-141, MM-310, MM-302 and MM-151, and expect to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that our future license agreements will impose, various diligence, milestone payment, royalty, insurance and other obligations on us. If we fail to comply with these obligations, our licensors may have the right to terminate these agreements, in which event we might not be able to develop and market any product that is covered by these agreements. Termination of these licenses or reduction or elimination of our licensed rights may result in our having to negotiate new or reinstated licenses with less favorable terms. The occurrence of such events could materially harm our business.

If we are unable to obtain and maintain patent protection for our technology and products, or if our licensors are unable to obtain and maintain patent protection for the technology or products that we license from them, our competitors could develop and commercialize technology and products similar or identical to ours, and our ability to successfully commercialize our technology and products may be adversely affected.

Our success depends in large part on our and our licensors' ability to obtain and maintain patent protection in the United States and other countries with respect to our proprietary technology and products. In some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology or products that we license from third parties. Therefore, we cannot be certain that these patents and applications will be prosecuted and enforced in a manner consistent with the best interests of our business. In addition, if third parties who license patents to us fail to maintain such patents, or lose rights to those patents, the rights we have licensed may be reduced or eliminated.

We have sought to protect our proprietary position by filing patent applications in the United States and abroad related to our novel technologies and products that are important to our business. This process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our and our licensors' patent rights are highly uncertain. Our and our licensors' pending and future patent applications may not result in patents being issued that protect our technology or products or that effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. The laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we or our licensors were the first to make the inventions claimed in our owned and licensed patents or pending patent applications, or that we or our licensors were the first to file for patent protection of such inventions. Assuming the other requirements for patentability are met, the first to file a patent application is entitled to the patent. Under the America Invents Act enacted in 2011, the United States moved to this first to file system in 2013 from the previous system under which the first to make the claimed invention was entitled to the patent. We may become involved in opposition, interference or derivation proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such proceeding could reduce the scope of, or invalidate, our patent rights, allow

third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights.

Even if our owned and licensed patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner. The issuance of a patent is not conclusive as to its scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in patent claims being narrowed, invalidated or held unenforceable, which could limit our ability to stop or prevent us from stopping others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

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

Competitors may infringe our patents. To counter infringement or unauthorized use, we may be required to initiate infringement lawsuits, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours is invalid or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents 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 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.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Our commercial success depends upon our ability and the ability of our collaborators to develop, manufacture, market and sell our products and product candidates and use our proprietary technologies without infringing the enforceable proprietary rights of third parties. We may become party to, or threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our products and technology, including interference or derivation proceedings before the U.S. Patent and Trademark Office. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future. If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. We could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, we could be found liable for monetary damages. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties can have a similar negative impact on our business.

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

Many of our employees were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these employees have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such employee's former employer. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities

analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce our resources available for development activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their substantially greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to our patented technology and products, we rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. We seek to protect these trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties that have access to them, such as our employees, corporate collaborators, outside scientific collaborators, sponsored researchers, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. In addition, any of these parties may breach the agreements and disclose our proprietary information, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

We may not be able to obtain, maintain or protect proprietary rights necessary for the continued development and commercialization of our products, product candidates and research technologies, including as a result of challenges from companies who seek to sell generic or biosimilar versions of our products after expiration of any regulatory exclusivity but prior to the applicable patent expiration.

Our commercial success depends in large part on obtaining and maintaining U.S. and foreign patent protection for our products, our product candidates and our research technologies and successfully enforcing and defending these patents against third-party challenges, including with respect to generic or biosimilar challenges. The validity of our patents in one or more jurisdictions may be challenged by third parties, resulting in our patents being deemed invalid, unenforceable or narrowed in scope, which could compromise the scope or duration of our exclusive rights in the relevant product, product candidate or technology. For example, the validity of a U.S. patent can be challenged in the U.S. Patent and Trademark Office (e.g., through an Inter Partes Review and/or Post Grant Review proceeding) and/or in U.S. federal district court.

In addition, our patents may also be challenged in a federal court in connection with a third party’s abbreviated new drug application, or ANDA, a Section 505(b)(2) new drug application, or NDA, or an abbreviated Biologic License Application, or aBLA, seeking FDA approval to market a generic version or a biosimilar version of our products, resulting in a patent challenge to one or more patents listed in the Orange Book for our product or that protect our biologic product. This patent challenge can result in one or more of those patents for our products being deemed uninfringed, invalid, unenforceable and/or narrowed in scope, which could compromise the scope or duration of our exclusive rights in the relevant product. An ANDA, Section 505(b)(2) NDA or aBLA can be filed after FDA approval of a product and the expiration of any relevant regulatory exclusivity. Other challenges to a patent may be mounted without regard to the date of an FDA approval.

Our patents as issued or as subsequently limited by any litigation might not contain claims that are sufficiently broad to prevent others from circumventing our patent protection and utilizing our technologies. For instance, the issued patents relating to our product candidates may be limited to a particular indication and/or composition and may not cover similar compositions that have similar clinical properties. Consequently, our competitors may independently develop competing products that do not infringe our patents or other intellectual property. Also, our pending patent applications may not issue, and we may not receive any additional patents. We cannot be sure that our patents and patent applications, including our own and those that we have rights to under licenses from third parties, will adequately protect our intellectual property for a number of reasons, including, among other things, the following: (i) the patent positions of pharmaceutical and biotechnology companies can be highly uncertain and involve complex legal and factual questions; (ii) the actual protection afforded by a patent can vary from country to country and may depend upon the type of patent, the scope of its coverage and the availability of legal remedies in the country; (iii) the laws of foreign countries in which we market our products may afford little or no effective protection to our intellectual property, thereby easing our competitors' ability to compete with us in such countries; (iv) intellectual property laws and regulations and legal standards relating to the validity, scope and enforcement of patents covering pharmaceutical and biotechnological inventions are continually developing and changing, both in the United States and in other important markets outside the United States; (v) third parties may challenge, infringe, circumvent or seek to invalidate existing or future patents owned by or licensed to us; and (vi) the coverage claimed in a patent application can be

significantly reduced before the patent is issued, and, as a consequence, our and our partners' patent applications may result in patents with narrower coverage than we desire or have planned for.

Risks Related to Regulatory Approval of Our Product Candidates

If we are not able to obtain required regulatory approvals, we will not be able to commercialize our product candidates, and our ability to generate revenue will be materially impaired.

Our product candidates, including our clinical stage product candidates, and the activities associated with their development and commercialization, including their design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, import, export, sampling and marketing are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by comparable authorities in other countries. Failure to obtain regulatory approval for a product candidate will prevent us from commercializing the product candidate. ONIVYDE was our first and only product candidate to receive regulatory approval, and so we have only limited experience in filing and supporting the applications necessary to gain regulatory approvals. Securing regulatory approval requires the submission of extensive preclinical and clinical data and supporting information to the FDA and other regulatory agencies for each therapeutic indication to establish the product candidate's safety and efficacy. Securing regulatory approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the FDA or other regulatory agencies. Our product candidates may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining regulatory approval or prevent or limit commercial use.

The process of obtaining regulatory approvals is expensive, may take many years if additional clinical trials are required, if approval is obtained at all, and can vary substantially based on a variety of factors, including the type, complexity and novelty of the product candidates involved. Changes in regulatory approval policies during the development period, changes in or the enactment of additional statutes or regulations, changes in regulatory review for each submitted product application or approval of other products for the same indication may cause delays in the approval or rejection of an application. Regulatory agencies have substantial discretion in the approval process and may refuse to accept any application or may decide that our data is insufficient for approval and require additional preclinical, clinical or other studies. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent regulatory approval of a product candidate. Any regulatory approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

If we pursue development of a diagnostic to identify patients who are likely to benefit from a therapeutic product, failure to obtain approval for the diagnostic may prevent or delay approval of the therapeutic product.

We are attempting to develop diagnostics to identify patients who are likely to benefit from our therapeutic product candidates. We currently rely on and expect to continue to rely on third parties for much of the development, testing and manufacturing of our diagnostics. We will likely rely on such third parties to also obtain any required regulatory approval for and then commercially supply such diagnostics. All of our diagnostic candidates are in preclinical or clinical development. We have very limited experience in the development of diagnostics and, even with the help of third parties with greater experience, may fail to obtain the required diagnostic product marketing approval, which could prevent or delay approval of the therapeutic product.

In July 2014, the FDA issued final guidance that stated that if safe and effective use of a therapeutic depends on an *in vitro* diagnostic, then the FDA generally will not approve the therapeutic unless the FDA approves or clears this "*in vitro* companion diagnostic device" at the same time that the FDA approves the therapeutic. The approval or clearance of the *in vitro* diagnostic most likely will occur through the FDA's Center for Devices and Radiological Health Office of In Vitro Diagnostics and Radiological Health. Even with the issuance of the final guidance, the FDA's expectations for *in vitro* companion diagnostics remain unclear in some respects. The FDA's developing expectations will affect our *in vitro* diagnostics. In particular, the FDA may limit our ability to use retrospective data, otherwise disagree with our approaches to trial design, biomarker qualification, clinical and analytical validity and clinical utility, or make us repeat aspects of the trial or initiate new trials.

Because our diagnostic candidates are at an early stage of development, we cannot yet know what the FDA will require for any of these tests. For our clinical stage product candidates, namely MM-121, MM-141 and MM-310, we are attempting to develop an *in vitro* diagnostic that will help identify patients likely to benefit from the therapy. Whether the FDA will consider these *in vitro* diagnostics to be "*in vitro* companion diagnostic devices" that require simultaneous approval or clearance with the therapeutics will depend on whether the FDA views the diagnostics to be essential to the safety and efficacy of these therapeutics.

Based on the FDA's past practice with companion diagnostics, if we are successful in developing a diagnostic for any of our clinical stage product candidates, we would expect that FDA approval of an *in vitro* companion diagnostic, or possibly an *in vivo* companion diagnostic, would be required for approval and subsequent commercialization of each such therapeutic product candidate.

We are not aware of any currently available diagnostics that, if necessary, would otherwise allow us to proceed with the approval and subsequent commercialization of our product candidates despite a delay in or failure of our attempts to develop diagnostics.

Because we expect to rely on third parties for various aspects of the development, testing and manufacture, as well as for regulatory approval for and commercial supply, of our diagnostics, the commercial success of any of our product candidates that require a diagnostic will be tied to and dependent on the continued ability of such third parties to make the diagnostic commercially available on reasonable terms in the relevant geographies.

If we fail to maintain orphan drug designation for MM-121 or MM-141, we will have to rely on other rights and protections.

We obtained orphan drug designation in the United States for MM-121 for the treatment of heregulin positive non-small cell lung cancer and for MM-141 for the treatment of pancreatic cancer. In the United States, under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is a drug intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States.

In the United States, the company that first obtains FDA approval for a designated orphan drug for the specified rare disease or condition receives orphan drug marketing exclusivity for that drug for that indication for a period of seven years. This orphan drug exclusivity prevents the FDA from approving another application, including a full NDA, to market the same drug for the same orphan indication, except in limited circumstances. For purposes of small molecule drugs, the FDA defines the term “same drug” to mean a drug that contains the same active molecule and that is intended for the same use as the approved orphan drug. Orphan drug exclusivity may be lost if the FDA determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition. Additionally, maintenance of the orphan drug designation requires the company holding such designation to continue to actively pursue development in that indication.

Even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs can be approved for the same condition. Even after an orphan drug is approved, the FDA can subsequently approve the same drug for the same condition if the FDA concludes that the later drug is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care.

On August 3, 2017, Congress passed the FDA Reauthorization Act of 2017, or FDARA. FDARA, among other things, codified the FDA’s pre-existing regulatory interpretation to require that a drug sponsor demonstrate the clinical superiority of an orphan drug that is otherwise the same as a previously approved drug for the same rare disease in order to receive orphan drug exclusivity. The new legislation reverses prior precedent holding that the Orphan Drug Act unambiguously requires that the FDA recognize the orphan exclusivity period regardless of a showing of clinical superiority. The FDA may further reevaluate the Orphan Drug Act and its regulations and policies. We do not know if, when or how the FDA may change the orphan drug regulations and policies in the future, and it is uncertain how any such changes might affect our business. Depending on what changes the FDA may make to its orphan drug regulations and policies, our business could be adversely impacted.

Our therapeutic product candidates for which we intend to seek approval as biological or drug products may face competition sooner than expected.

With the enactment of the Biologics Price Competition and Innovation Act of 2009, or BPCIA, as part of the Health Care and Education Reconciliation Act of 2010, or the Health Care Reform Laws, an abbreviated pathway for the approval of biosimilar and interchangeable biological products was created. The abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as “interchangeable” based on their similarity to existing brand product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until twelve years after the original branded product was approved under a biologics license application, or BLA. The BPCIA is complex and has yet to be fully interpreted and implemented by the FDA. As a result, its ultimate impact, implementation and meaning is subject to uncertainty. While it is uncertain when any such processes may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

We believe that any of our products approved as a biological product under a BLA should qualify for the twelve year period of exclusivity. However:

- a potential competitor could seek and obtain approval of its own BLA during our exclusivity period instead of seeking approval of a biosimilar version; and
- the FDA could consider a particular product candidate which contains both drug and biological product components to be a drug subject to review pursuant to an NDA, and therefore eligible for a significantly shorter marketing exclusivity period as provided under the Drug Price Competition and Patent Term Restoration Act of 1984.

Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear and will depend on a number of marketplace and regulatory factors that are still developing.

In addition, a drug product approved under an NDA could face generic competition earlier than expected. The enactment of the Generic Drug User Fee Amendments of 2012 as part of the Food and Drug Administration Safety and Innovation Act of 2012 established a user fee program that will generate hundreds of millions of dollars in funding for the FDA's generic drug review program. Funding from the user fee program, along with performance goals that the FDA negotiated with the generic drug industry, is significantly decreasing the timeframe for FDA review and approval of generic drug applications.

Failure to obtain regulatory approval in international jurisdictions would prevent us from marketing our products abroad.

We intend to market any product for which we obtain marketing approval, either ourselves or with commercialization partners, both within and outside the United States. This may increase the risks described below with respect to our compliance with foreign regulations.

In order to market and sell any approved products in the European Union and many other jurisdictions, we or our commercialization partners must obtain separate regulatory approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing, including sometimes additional testing in children. The time required to obtain approval in foreign countries may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be sold in that country. We or our future commercialization partners may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We or our future commercialization partners may not be able to file for regulatory approvals and may not receive necessary approvals to commercialize our products in any market.

Additionally, on June 23, 2016, the electorate in the United Kingdom voted in favor of leaving the European Union, commonly referred to as Brexit. On March 29, 2017, the country formally notified the European Union of its intention to withdraw pursuant to Article 50 of the Lisbon Treaty. Since a significant proportion of the regulatory framework in the United Kingdom is derived from European Union directives and regulations, the referendum could materially impact the regulatory regime with respect to the approval of our product candidates in the United Kingdom or the European Union. Any delay in obtaining, or an inability to obtain, any marketing approvals as a result of Brexit or otherwise would prevent us from commercializing our product candidates in the United Kingdom and/or the European Union and restrict our ability to generate revenue and achieve and sustain profitability. If any of these outcomes occur, we may be forced to restrict or delay efforts to seek regulatory approval in the United Kingdom and/or European Union for our product candidates, which could significantly and materially harm our business.

Any product for which we obtain marketing approval could be subject to restrictions or withdrawal from the market and we may be subject to penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with our products, when and if any of them are approved.

Any product for which we may obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising and promotional activities for such product, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP or QSR requirements relating to quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. Even if regulatory approval of a product is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the product. Later discovery of previously unknown problems with our products, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in actions such as:

- restrictions on such products, manufacturers or manufacturing processes;
- restrictions on the marketing of a product;
- restrictions on product distribution;
- requirements to conduct post-marketing clinical trials;
- warning or untitled letters;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of products;
- fines, restitution or disgorgement of profits or revenue;
- suspension or withdrawal of regulatory approvals;
- refusal to permit the import or export of our products;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

The FDA has sweeping inspection authorities to enforce the Federal Food, Drug, and Cosmetic Act. Under the statute, a drug or biologic will be considered adulterated, with possible resulting civil and criminal penalties, if the owner or operator of the establishment where it is made, processed, packed or held delays, denies, limits or refuses inspection. The FDA employs a risk-based inspection schedule to ensure compliance. The law grants the FDA authority to require a drug or biologics manufacturer to provide, in advance or instead of an inspection, and at the manufacturer’s expense, any records or other information that the agency may otherwise inspect at the facility. The FDA may also share inspection information with foreign governments under certain circumstances.

The FDA also has broad authority to take action against manufacturers of drugs or biologics that are not adhering to pediatric study requirements, which apply even if the manufacturer is not seeking to market the drug or biologic to pediatric patients. As of April 2013, the FDA must issue non-compliance letters to companies who do not meet the pediatric study requirements. Any company receiving a non-compliance letter would have an opportunity to respond, and the non-compliance letter and company response would become publicly available.

Current and future legislation may increase the difficulty and cost for us and any future collaborators to obtain marketing approval of and commercialize our product candidates and affect the prices we, or they, may obtain.

In the United States and some foreign jurisdictions, there have been and continue to be a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability, or the ability of any future collaborators, to profitably sell any products for which we, or they, obtain marketing approval. We expect that current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we, or any future collaborators, may receive for any approved products.

In March 2010, former President Obama signed into law the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively the ACA. Among the provisions of the ACA of potential importance to our business and our product candidates are the following:

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

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. These changes include the Budget Control Act of 2011, which, among other things, led to aggregate reductions to Medicare payments to providers of up to 2% per fiscal year that started in 2013 and, due to subsequent legislative amendments to the statute, will stay in effect through 2025 unless additional congressional action is taken, and the American Taxpayer Relief Act of 2012, which, among other things, reduced Medicare payments to several types of providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our product candidates for which we may obtain regulatory approval or the frequency with which any such product candidate is prescribed or used. Further, there have been several recent U.S. congressional inquiries and proposed state and federal legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products.

We expect that these healthcare reforms, as well as other healthcare reform measures that may be adopted in the future, may result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, new payment methodologies and additional downward pressure on the price that we receive for any approved product and/or the level of reimbursement physicians receive for administering any approved product we might bring to market. Reductions in reimbursement levels may negatively impact the prices we receive or the frequency with which our products are prescribed or administered. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

Since enactment of the ACA, there have been numerous legal challenges and Congressional actions to repeal and replace provisions of the law. In May 2017, the U.S. House of Representatives passed legislation known as the American Health Care Act of 2017. Thereafter, the Senate Republicans introduced and then updated a bill to replace the ACA known as the Better Care Reconciliation Act of 2017. The Senate Republicans also introduced legislation to repeal the ACA without companion legislation to replace it, and a "skinny" version of the Better Care Reconciliation Act of 2017. In addition, the Senate considered proposed healthcare reform legislation known as the Graham-Cassidy bill. None of these measures was passed by the U.S. Senate.

The Trump Administration has also taken executive actions to undermine or delay implementation of the ACA. In January 2017, President Trump signed an executive order directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers or manufacturers of pharmaceuticals or medical devices. In October 2017, President Trump signed a second Executive Order allowing for the use of association health plans and short-term health insurance, which may provide fewer health benefits than the plans sold through the ACA exchanges. At the same time, the Administration announced that it will discontinue the payment of cost-sharing reduction, or CSR, payments to insurance companies until Congress approves the appropriation of funds for such CSR payments. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA.

A bipartisan bill to appropriate funds for CSR payments was introduced in the Senate, but the future of that bill is uncertain. Further, each chamber of the Congress has put forth multiple bills designed to repeal or repeal and replace portions of the ACA.

Although none of these measures has been enacted by Congress to date, Congress may consider other legislation to repeal and replace elements of the ACA. The Congress will likely consider other legislation to replace elements of the ACA during the next Congressional session. We will continue to evaluate the effect that the ACA and its possible repeal and replacement could have on our business.

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

If we fail to comply with our reporting and payment obligations under U.S. governmental pricing programs, we could be required to reimburse government programs for underpayments and could pay penalties, sanctions and fines which could have a material adverse effect on our business, financial condition and results of operations.

As a condition of reimbursement for any product approved by the FDA, various U.S. federal and state healthcare programs require that certain pricing information be calculated and reported to U.S. federal and state healthcare agencies. For example, average selling price information must be reported to CMS on a quarterly basis in order to compute Medicare Part B payment rates. Price reporting and payment obligations are highly complex and vary among products and programs. The calculation of average selling price includes a number of inputs from contracts with wholesalers, specialty distributors, group purchasing organizations and other customers. Manufacturers are also required to make an assessment of whether these agreements are deemed to be for bona fide services and that the services are deemed to be at fair market value in our industry and for our products. Our processes for estimating amounts due under these governmental pricing programs have involved, and in the future would almost certainly involve, subjective decisions. As a result, our price reporting calculations are subject to the risk of errors and our methodologies for calculating these prices could be challenged under the federal False Claims Act or other laws. In addition, the Health Care Reform Laws modified the rules related to certain price reports and expanded the scope of pharmaceutical product sales to which Medicaid rebates apply, among other things. Uncertainty exists currently, as many of the specific determinations necessary to implement this new legislation have yet to be decided and communicated to industry participants. This uncertainty in the interpretation of the legislation increases the chances of an error in price reporting, which could in turn lead to a legal challenge, restatement or investigation. If we become subject to investigations, restatements or other inquiries concerning our compliance with price reporting laws and regulations, we could be required to pay or be subject to additional reimbursements, penalties, sanctions or fines, which could have a material adverse effect on our business, financial condition and results of operations.

We participate in and have certain price reporting obligations to the Medicaid Drug Rebate program and other governmental pricing programs, and we have obligations to report average sales price under the Medicare program. Pricing and rebate calculations vary among products and programs. The calculations are complex and are often subject to interpretation by governmental or regulatory agencies and the courts. For example, the Medicaid rebate amount is computed each quarter based on our submission to the CMS of our average manufacturer price, or AMP, and best price for the quarter. If we become aware that our reporting for prior quarters was incorrect, or has changed as a result of recalculation of the pricing data, we will be obligated to resubmit the corrected data for a period not to exceed twelve quarters from the quarter in which the data originally were due. Such restatements and recalculations would serve to increase our costs for complying with the laws and regulations governing the Medicaid rebate program. Any corrections to our rebate calculations could result in an overage or underage in our rebate liability for past quarters, depending on the nature of the correction. Price recalculations also may affect the price that we will be required to charge certain safety net providers under the Public Health Service 340B drug pricing program.

We are liable for errors associated with our submission of pricing data and for overcharging government payers. For example, in addition to retroactive rebates and the potential for 340B program refunds, if we are found to have knowingly submitted false AMP or best price information to the government, we may be liable for civil monetary penalties in the amount of $100,000 per item of false information. Our failure to submit monthly/quarterly AMP and best price data on a timely basis could result in a civil monetary penalty of $10,000 per day for each day the submission is late beyond the due date. In the event that CMS were to terminate our rebate agreement, no federal payments would be available under Medicaid or Medicare Part B for our products. In addition, if we overcharge the government in connection with our Federal Supply Schedule, or FSS, contract or under any other government program, we will be required to refund the difference to the government. Failure to make necessary disclosures and/or to identify contract overcharges could result in allegations against us under the federal civil False Claims Act and other laws and regulations.

CMS and the Office of Inspector General of the U.S. Department of Health and Human Services have pursued manufacturers that were alleged to have failed to report these data to the government in a timely manner. Governmental agencies may also make

changes in program interpretations, requirements or conditions of participation, some of which may have implications for amounts previously estimated or paid. We cannot assure you that our submissions will not be found by CMS to be incomplete or incorrect.

If we overcharge the government in connection with our FSS contract or the Tricare retail pharmacy program, whether due to a misstated Federal Ceiling Price or otherwise, we would be required to refund the difference to the government. Failure to make necessary disclosures and/or to identify contract overcharges can result in allegations against us under the False Claims Act and other laws and regulations.

Unexpected refunds to the federal government, and responding to a government investigation or enforcement action, would be expensive and time-consuming, and could have a material adverse effect on our business, financial condition, results of operations and growth prospects.

Risks Related to Commercialization of Our Product Candidates

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products. If we are found to have improperly promoted off-label uses while we marketed ONIVYDE, we may become subject to significant fines and other liability.

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory agencies as reflected in the product's approved labeling. If we are found to have promoted for off-label uses, we may become subject to significant government fines and other related liability. For example, the U.S. government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The government has also required companies to enter into complex multi-year corporate integrity agreements and/or non-prosecution agreements that can impose significant restrictions and other burdens on the affected companies.

In addition, incentives under applicable U.S. laws encourage employees and physicians to report violations of rules governing promotional activities for pharmaceutical products. These incentives could lead to so called whistleblower lawsuits as part of which such persons seek to collect a portion of moneys allegedly overbilled to government agencies due to, for example, promotion of pharmaceutical products beyond labeled claims. Such lawsuits, whether with or without merit, are typically time consuming and costly to defend. Such suits may also result in related stockholder lawsuits, which are also costly to defend.

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

Healthcare providers, physicians and others play a primary role in the recommendation and prescription of products for which we obtain marketing approval. Arrangements with third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute any products for which we obtain marketing approval. Restrictions under applicable federal, state and foreign healthcare laws and regulations include the following:

- the federal healthcare anti-kickback statute prohibits, among other things, knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward the purchasing, leasing, ordering or arranging for the purchase, order or recommendation of any item or service reimbursable under Medicare, Medicaid, or other federal healthcare programs. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers and formulary managers on the other, and violations are punishable by imprisonment, criminal fines, civil monetary penalties and exclusion from participation in federal healthcare programs. Although there are a number of statutory exemptions and regulatory safe harbors protecting certain common activities from prosecution or other regulatory sanctions, the exemptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exemption or safe harbor;
- the federal False Claims Act prohibits any person from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, or knowingly making, or causing to be made, a false statement to have a false claim paid. Government enforcement agencies and private whistleblowers have initiated investigations or brought private lawsuits against pharmaceutical companies for a variety of allegedly improper promotional or marketing activities, such as allegedly inflating drug prices they report to pricing services, which in turn were used by the government to set Medicare and Medicaid reimbursement rates; allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product; or engaging in promotion for "off-label" uses. Additionally, the Health Care

Reform Laws amended the federal False Claims Act such that a violation of the federal anti-kickback statute can serve as a basis for liability under the False Claims Act;

- the federal Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act, or HIPAA, makes it a crime to knowingly and willfully execute or attempt to execute a scheme to defraud any healthcare benefit program and also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;
- the federal false statements statute prohibits, among other things, knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the federal transparency requirements under the Health Care Reform Laws require manufacturers of drugs, devices, biologics and medical supplies reimbursable under Medicare and Medicaid to report to the Department of Health and Human Services information related to payments and other transfers of value to physicians and teaching hospitals, as well as physician ownership and investment interests, and provide for public reporting of the data reported by manufacturers;
- the U.S. Foreign Corrupt Practices Act prohibits U.S. companies and their representatives from paying, offering to pay, promising or authorizing the payment of anything of value to any foreign government official, government staff member, political party or political candidate for the purpose of obtaining or retaining business or to otherwise obtain favorable treatment or influence a person working in an official capacity, and encompasses many healthcare professionals in many countries under the definition of a foreign government official;
- the Bribery Act, which applies to U.S. companies such as ourselves that conduct business in the United Kingdom, proscribes giving and receiving bribes in the public and private sectors, bribing a foreign public official and failing to have adequate procedures to prevent employees and other agents from giving bribes; and
- analogous state laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers. In addition, some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government. Other states require pharmaceutical manufacturers to report information related to payments to physicians and other healthcare providers or marketing expenditures, or prohibit certain marketing-related activities including the provision of gifts, meals or other items to certain healthcare providers.

Efforts to ensure that our business arrangements with third parties comply with applicable healthcare laws and regulations involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we do business are found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Even if we are not determined to have violated these laws, government investigations into these issues typically require the expenditure of significant resources and generate negative publicity, which could also harm our financial condition. Responding to government investigations or whistleblower lawsuits, defending any claims raised, and any resulting fines, damages, penalties, settlement payments or administrative actions, as well as any related actions brought by stockholders or other third parties, could have a material impact on our reputation, business and financial condition and divert the attention of our management from operating our business.

Our corporate compliance efforts cannot guarantee that we are in compliance with all potentially applicable regulations.

The development, manufacturing, pricing, sales, coverage and reimbursement of our products, together with our general operations, are and will be subject to extensive regulation by federal, state and other authorities within the United States and numerous entities outside of the United States. While we have implemented a corporate compliance program based on what we believe are the current best practices, we cannot provide any assurance that governmental authorities will find that our business practices comply with current or future administrative or judicial interpretations of potentially applicable laws and regulations. If we fail to comply with any of these laws and regulations, we could be subject to a range of regulatory actions, including suspension or termination of clinical trials, the failure to approve a product candidate, restrictions on our products or manufacturing processes, withdrawal of products from the market, significant fines, disqualification or debarment from participation in federally-funded healthcare programs or other sanctions or litigation, any of which events may have a significant adverse impact on our business.

Risks Related to Data Protection and Cybersecurity

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

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

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

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

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

Risks Related to Employee Matters and Managing Growth

Our future success depends on our ability to retain our key executives and to attract, retain and motivate qualified personnel.

We are highly dependent on the principal members of our executive and scientific teams. Although we have formal employment agreements with each of our executive officers, these agreements do not prevent our executives from terminating their employment with us at any time. We do not maintain “key person” insurance for any of our executives or other employees. The loss of the services of any of these persons could impede the achievement of our research, development and commercialization objectives.

Recruiting and retaining qualified scientific, clinical, manufacturing and sales and marketing personnel will also be critical to our success. We may not be able to attract and retain these personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

Our corporate restructuring and the associated headcount reductions announced in October 2016 and January 2017 may not result in anticipated savings, could result in total costs and expenses and attrition that are greater than expected and could disrupt our business.

On October 3, 2016, we announced a 22% reduction in headcount as part of a major corporate restructuring with the objective of prioritizing our research and development on a focused set of systems biology-derived oncology products and strengthening our financial runway. Additionally, on January 8, 2017, we announced a further planned reduction in headcount in connection with the closing of the asset sale to Ipsen and the completion of our strategic pipeline review. We may not realize, in full or in part, the anticipated benefits, savings and improvements in our cost structure from our restructuring efforts due to unforeseen difficulties, delays or unexpected costs. If we are unable to realize the expected operational efficiencies and cost savings from the restructuring, our operating results and financial condition would be adversely affected. We also cannot guarantee that we will not have to undertake additional headcount reductions or restructuring activities in the future. Furthermore, our restructuring plan may be disruptive to our operations. For example, our headcount reductions could yield unanticipated consequences, such as attrition beyond planned staff reductions, or increase difficulties in our day-to-day operations. Our headcount reductions could also harm our ability to attract and retain qualified management, scientific, clinical, manufacturing and sales and marketing personnel who are critical to our business. Any failure to attract or retain qualified personnel could prevent us from successfully developing and commercializing our product candidates in the future.

We have entered into and may continue to enter into or seek to enter into business combinations, acquisitions or divestitures which may be difficult to consummate, disrupt our business, divert management attention or dilute stockholder value.

As part of our business strategy, we may enter into business combinations, acquisitions or divestitures. Although we acquired Hermes in October 2009 and consummated the asset sale to Ipsen in April 2017, we have limited experience in making acquisitions and divestitures. In addition, acquisitions and divestitures are typically accompanied by a number of risks, including:

- the difficulty of integrating or separating the operations and personnel of the acquired companies or divested product;
- the potential disruption of our ongoing business and distraction of management;
- potential unknown liabilities and expenses;
- the failure to achieve the expected benefits of the combination, acquisition or divestiture;
- the maintenance of acceptable standards, controls, procedures and policies; and
- the impairment of relationships with employees as a result of any integration or separation of management and other personnel.

If we are not successful in completing acquisitions or divestitures that we may pursue in the future, we would be required to reevaluate our business strategy and we may have incurred substantial expenses and devoted significant management time and resources in seeking to complete the acquisitions or divestitures. In addition, with future acquisitions, we could use substantial portions of our available cash as all or a portion of the purchase price. As we did for the acquisition of Hermes, we could also issue additional securities as consideration for these acquisitions, which could cause our stockholders to suffer significant dilution.

Risks Related to Our Common Stock

Our executive officers, directors and principal stockholders maintain the ability to significantly influence all matters submitted to stockholders for approval.

Our executive officers, directors and stockholders who own more than 5% of our outstanding common stock, in the aggregate, beneficially own a large portion of our capital stock. As a result, if these stockholders were to choose to act together, they would be able to significantly influence all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they choose to act together, would significantly influence the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of voting power could allow, delay or prevent an acquisition of our company on terms that other stockholders may desire.

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

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

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

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Further, the repurchase right under the convertible notes in connection with a fundamental change (as defined therein) and any increase in the conversion rate in connection with a make-whole fundamental change could also discourage a potential acquirer.

Our stock price has been and may in the future be volatile, which could cause holders of our common stock to incur substantial losses.

Our stock price has been and in the future may be subject to substantial price volatility. The stock market in general and the market for biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, our stockholders could incur substantial losses. The market price for our common stock may be influenced by many factors, including:

- the success of competitive products or technologies;
- results of clinical trials of our product candidates or those of our competitors;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patents or other proprietary rights;
- the recruitment or departure of key personnel;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors and issuance of new or changed securities analysts’ reports or recommendations;
- activism by any single large stockholder or combination of stockholders;

- general economic, industry and market conditions; and
- the other factors described in this “Risk Factors” section.

Because we do not anticipate paying regular cash dividends on our common stock in the foreseeable future, capital appreciation, if any, will be the sole source of gain for holders of our common stock.

We have not historically declared or paid cash dividends on our common stock. Although our board of directors declared a special cash dividend of $140.0 million, which was payable on May 26, 2017 to stockholders of record as of the close of business on May 17, 2017, we do not currently intend to pay any regular cash dividends in the foreseeable future. Additionally, as a result of the amount that we paid pursuant to the settlement agreement, the amount that we expect to pay to acquire the remaining notes and other costs and expenses incurred related to the Delaware Action, we will have exhausted the full amount of the escrow funds and do not intend to declare an additional special dividend with respect to any portion of the escrow funds. In addition, the terms of any future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be the sole source of gain for holders of our common stock for the foreseeable future.

Future sales of shares of our common stock, including by us or our directors and executive officers or shares issued upon the exercise of currently outstanding options, or upon conversion of our outstanding convertible notes, could cause the market price of our common stock to drop significantly, even if our business is doing well.

A substantial portion of our outstanding common stock can be traded without restriction at any time. In addition, a portion of our outstanding common stock is currently restricted as a result of federal securities laws, but can be sold at any time subject to applicable volume limitations. As such, sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, by us or others, could reduce the market price of our common stock. In addition, we have a significant number of shares that are subject to outstanding options, and we may issue shares of our common stock upon conversion of our outstanding convertible notes. The exercise of these options or the issuance of shares of our common stock upon conversion of our outstanding convertible notes and the subsequent sale of the underlying common stock could cause a further decline in our stock price. For instance, in April 2016, we issued an aggregate of 12,367,663 shares of our common stock to certain holders of our convertible notes who had agreed to convert an aggregate of $64.2 million of convertible notes. These sales also might make it difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate. We cannot predict the size of future issuances or the effect, if any, that any future issuances may have on the market price for our common stock.

Item 5. Other Information.

Our board of directors has set June 12, 2018 as the date for our 2018 Annual Meeting of Stockholders. Proposals of stockholders intended to be presented at our 2018 Annual Meeting of Stockholders pursuant to Rule 14a-8 promulgated under the Exchange Act must be received by us at our principal executive offices, One Kendall Square, Suite B7201, Cambridge, Massachusetts 02139, no later than December 28, 2017 in order to be included in the proxy statement and proxy card relating to that meeting.

If a stockholder wishes to present a proposal at our 2018 Annual Meeting of Stockholders, but does not wish to have the proposal considered for inclusion in our proxy statement and proxy card, pursuant to the advance notice provision in our bylaws, such stockholder must give written notice to our Corporate Secretary at our principal executive offices at the address noted above. Our Corporate Secretary must receive such notice no earlier than February 12, 2018 and no later than March 14, 2018.

Item 6. Exhibits.

Exhibit Number	Description of Exhibit
3.1*	Restated Certificate of Incorporation of the Registrant, as amended
10.1*	Employment Agreement, dated as of July 18, 2017, by and between the Registrant and Thomas E. Needham, Jr.
10.2*	Employment Agreement, dated as of August 10, 2017, by and between the Registrant and Jean M. Franchi
31.1*	Certification of Principal Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

31.2*	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1+	Certification of Principal Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2+	Certification of 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.INS*	XBRL Instance Document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Database
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

* Filed herewith.

+ Furnished herewith.

SIGNATURES

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

MERRIMACK PHARMACEUTICALS, INC.

Date: November 8, 2017

By: /s/ Jean M. Franchi
Jean M. Franchi
Chief Financial Officer
(Principal Financial Officer)

Exhibit 3.1

RESTATED CERTIFICATE OF INCORPORATION

OF

MERRIMACK PHARMACEUTICALS, INC.

Merrimack Pharmaceuticals, Inc. (the "Corporation"), a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware, does hereby certify as follows:

The current name of the Corporation is Merrimack Pharmaceuticals, Inc. The original Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on July 6, 2010. The Certificate of Incorporation was amended and restated on April 6, 2011. A Certificate of Amendment was filed on January 30, 2012.

A resolution was duly adopted by the Board of Directors of the Corporation pursuant to Sections 242 and 245 of the General Corporation Law of the State of Delaware setting forth this Restated Certificate of Incorporation and declaring such Restated Certificate of Incorporation advisable. The stockholders of the Corporation duly approved and adopted this Restated Certificate of Incorporation by written consent in accordance with Sections 228, 242 and 245 of the General Corporation Law of the State of Delaware.

Accordingly, the Certificate of Incorporation of this Corporation, as previously amended and restated, is hereby further amended and restated in its entirety to read as follows:

FIRST: The name of the Corporation is Merrimack Pharmaceuticals, Inc.

SECOND: The address of the Corporation's registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, County of New Castle, 19801. The name of its registered agent at that address is The Corporation Trust Company.

THIRD: The nature of the business or purposes to be conducted or promoted by the Corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of the State of Delaware.

FOURTH: The total number of shares of all classes of stock which the Corporation shall have authority to issue is 210,000,000 shares, consisting of (i) 200,000,000 shares of Common Stock, $0.01 par value per share ("Common Stock"), and (ii) 10,000,000 shares of Preferred Stock, $0.01 par value per share ("Preferred Stock").

The following is a statement of the designations and the powers, privileges and rights, and the qualifications, limitations or restrictions thereof in respect of each class of capital stock of the Corporation.

A. COMMON STOCK

1. General. The voting, dividend and liquidation rights of the holders of the Common Stock are subject to and qualified by the rights of the holders of the Preferred Stock of any series as may be designated by the Board of Directors upon any issuance of the Preferred Stock of any series.

2. Voting. The holders of the Common Stock shall have voting rights at all meetings of stockholders, each such holder being entitled to one vote for each share thereof held by such holder; provided, however, that, except as otherwise required by law, holders of Common Stock shall not be entitled to vote on any amendment to this Restated Certificate of Incorporation (which, as used herein, shall mean the certificate of incorporation of the Corporation, as amended from time to time, including the terms of any certificate of designations of any series of Preferred Stock) that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together as a class with the holders of one or more other such series, to vote thereon pursuant to this Restated Certificate of Incorporation. There shall be no cumulative voting.

The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the stock of the Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law of the State of Delaware.

3. Dividends. Dividends may be declared and paid on the Common Stock from funds lawfully available therefor as and when determined by the Board of Directors and subject to any preferential dividend or other rights of any then outstanding Preferred Stock.

4. Liquidation. Upon the dissolution or liquidation of the Corporation, whether voluntary or involuntary, holders of Common Stock will be entitled to receive all assets of the Corporation available for distribution to its stockholders, subject to any preferential or other rights of any then outstanding Preferred Stock.

B. PREFERRED STOCK

Preferred Stock may be issued from time to time in one or more series, each of such series to have such terms as stated or expressed herein and in the resolution or resolutions providing for the issue of such series adopted by the Board of Directors of the Corporation as hereinafter provided. Any shares of Preferred Stock which may be redeemed, purchased or acquired by the Corporation may be reissued except as otherwise provided by law.

Authority is hereby expressly granted to the Board of Directors from time to time to issue the Preferred Stock in one or more series, and in connection with the creation of any such series, by adopting a resolution or resolutions providing for the issuance of the shares thereof and by filing a certificate of designations relating thereto in accordance with the General Corporation Law of the State of Delaware, to determine and fix the number of shares of such series and such voting powers, full or limited, or no voting powers, and such designations, preferences and relative participating, optional or other special rights, and qualifications, limitations or restrictions thereof, including without limitation thereof, dividend rights, conversion rights,

redemption privileges and liquidation preferences, as shall be stated and expressed in such resolutions, all to the full extent now or hereafter permitted by the General Corporation Law of the State of Delaware. Without limiting the generality of the foregoing, the resolutions providing for issuance of any series of Preferred Stock may provide that such series shall be superior or rank equally or be junior to any other series of Preferred Stock to the extent permitted by law.

The number of authorized shares of Preferred Stock may be increased or decreased (but not below the number of shares then outstanding) by the affirmative vote of the holders of a majority of the voting power of the capital stock of the Corporation entitled to vote thereon, voting as a single class, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law of the State of Delaware.

FIFTH: Except as otherwise provided herein, the Corporation reserves the right to amend, alter, change or repeal any provision contained in this Restated Certificate of Incorporation, in the manner now or hereafter prescribed by statute and this Restated Certificate of Incorporation, and all rights conferred upon stockholders herein are granted subject to this reservation.

SIXTH: In furtherance and not in limitation of the powers conferred upon it by the General Corporation Law of the State of Delaware, and subject to the terms of any series of Preferred Stock, the Board of Directors shall have the power to adopt, amend, alter or repeal the Bylaws of the Corporation by the affirmative vote of a majority of the directors present at any regular or special meeting of the Board of Directors at which a quorum is present. The stockholders may not adopt, amend, alter or repeal the Bylaws of the Corporation, or adopt any provision inconsistent therewith, unless such action is approved, in addition to any other vote required by this Restated Certificate of Incorporation, by the affirmative vote of the holders of at least seventy-five percent (75%) of the votes that all the stockholders would be entitled to cast in any annual election of directors. Notwithstanding any other provisions of law, this Restated Certificate of Incorporation or the Bylaws of the Corporation, and notwithstanding the fact that a lesser percentage may be specified by law, the affirmative vote of the holders of at least seventy-five percent (75%) of the votes which all the stockholders would be entitled to cast in any annual election of directors shall be required to amend or repeal, or to adopt any provision inconsistent with, this Article SIXTH.

SEVENTH: Except to the extent that the General Corporation Law of the State of Delaware prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty, no director of the Corporation shall be personally liable to the Corporation or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability. No amendment to or repeal of this provision shall apply to or have any effect on the liability or alleged liability of any director of the Corporation for or with respect to any acts or omissions of such director occurring prior to such amendment or repeal. If the General Corporation Law of the State of Delaware is amended to permit further elimination or limitation of the personal liability of directors, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law of the State of Delaware as so amended.

EIGHTH: The Corporation shall provide indemnification as follows:

1. Actions, Suits and Proceedings Other than by or in the Right of the Corporation. The Corporation shall indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the Corporation) by reason of the fact that he or she is or was, or has agreed to become, a director or officer of the Corporation, or is or was serving, or has agreed to serve, at the request of the Corporation, as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (including any employee benefit plan) (all such persons being referred to hereafter as an "Indemnitee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), liabilities, losses, judgments, fines (including excise taxes and penalties arising under the Employee Retirement Income Security Act of 1974), and amounts paid in settlement actually and reasonably incurred by or on behalf of Indemnitee in connection with such action, suit or proceeding and any appeal therefrom, if Indemnitee acted in good faith and in a manner which Indemnitee reasonably believed to be in, or not opposed to, the best interests of the Corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful. The termination of any action, suit or proceeding by judgment, order, settlement, conviction or upon a plea of nolo contendere or its equivalent, shall not, of itself, create a presumption that Indemnitee did not act in good faith and in a manner which Indemnitee reasonably believed to be in, or not opposed to, the best interests of the Corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that his or her conduct was unlawful.

2. Actions or Suits by or in the Right of the Corporation. The Corporation shall indemnify any Indemnitee who was or is a party to or threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the Corporation to procure a judgment in its favor by reason of the fact that Indemnitee is or was, or has agreed to become, a director or officer of the Corporation, or is or was serving, or has agreed to serve, at the request of the Corporation, as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (including any employee benefit plan), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred by or on behalf of Indemnitee in connection with such action, suit or proceeding and any appeal therefrom, if Indemnitee acted in good faith and in a manner which Indemnitee reasonably believed to be in, or not opposed to, the best interests of the Corporation, except that no indemnification shall be made under this Section 2 in respect of any claim, issue or matter as to which Indemnitee shall have been adjudged to be liable to the Corporation, unless, and only to the extent, that the Court of Chancery of Delaware or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of such liability but in view of all the circumstances of the case, Indemnitee is fairly and reasonably entitled to indemnity for such expenses (including attorneys' fees) which the Court of Chancery of Delaware or such other court shall deem proper.

3. Indemnification for Expenses of Successful Party. Notwithstanding any other provisions of this Article EIGHTH, to the extent that an Indemnitee has been successful, on the merits or otherwise, in defense of any action, suit or proceeding referred to in Sections 1 and 2 of this Article EIGHTH, or in defense of any claim, issue or matter therein, or on appeal from any

such action, suit or proceeding, Indemnitee shall be indemnified against all expenses (including attorneys' fees) actually and reasonably incurred by or on behalf of Indemnitee in connection therewith. Without limiting the foregoing, if any action, suit or proceeding is disposed of, on the merits or otherwise (including a disposition without prejudice), without (i) the disposition being adverse to Indemnitee, (ii) an adjudication that Indemnitee was liable to the Corporation, (iii) a plea of guilty or nolo contendere by Indemnitee, (iv) an adjudication that Indemnitee did not act in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the Corporation, and (v) with respect to any criminal proceeding, an adjudication that Indemnitee had reasonable cause to believe his or her conduct was unlawful, Indemnitee shall be considered for the purposes hereof to have been wholly successful with respect thereto.

4. Notification and Defense of Claim. As a condition precedent to an Indemnitee's right to be indemnified, such Indemnitee must notify the Corporation in writing as soon as practicable of any action, suit, proceeding or investigation involving such Indemnitee for which indemnity will or could be sought. With respect to any action, suit, proceeding or investigation of which the Corporation is so notified, the Corporation will be entitled to participate therein at its own expense and/or to assume the defense thereof at its own expense, with legal counsel reasonably acceptable to Indemnitee. After notice from the Corporation to Indemnitee of its election so to assume such defense, the Corporation shall not be liable to Indemnitee for any legal or other expenses subsequently incurred by Indemnitee in connection with such action, suit, proceeding or investigation, other than as provided below in this Section 4. Indemnitee shall have the right to employ his or her own counsel in connection with such action, suit, proceeding or investigation, but the fees and expenses of such counsel incurred after notice from the Corporation of its assumption of the defense thereof shall be at the expense of Indemnitee unless (i) the employment of counsel by Indemnitee has been authorized by the Corporation, (ii) counsel to Indemnitee shall have reasonably concluded that there may be a conflict of interest or position on any significant issue between the Corporation and Indemnitee in the conduct of the defense of such action, suit, proceeding or investigation or (iii) the Corporation shall not in fact have employed counsel to assume the defense of such action, suit, proceeding or investigation, in each of which cases the fees and expenses of counsel for Indemnitee shall be at the expense of the Corporation, except as otherwise expressly provided by this Article EIGHTH. The Corporation shall not be entitled, without the consent of Indemnitee, to assume the defense of any claim brought by or in the right of the Corporation or as to which counsel for Indemnitee shall have reasonably made the conclusion provided for in clause (ii) above. The Corporation shall not be required to indemnify Indemnitee under this Article EIGHTH for any amounts paid in settlement of any action, suit, proceeding or investigation effected without its written consent. The Corporation shall not settle any action, suit, proceeding or investigation in any manner which would impose any penalty or limitation on Indemnitee without Indemnitee's written consent. Neither the Corporation nor Indemnitee will unreasonably withhold or delay its consent to any proposed settlement.

5. Advance of Expenses. Subject to the provisions of Section 6 of this Article EIGHTH, in the event of any threatened or pending action, suit, proceeding or investigation of which the Corporation receives notice under this Article EIGHTH, any expenses (including attorneys' fees) incurred by or on behalf of Indemnitee in defending an action, suit, proceeding or investigation or any appeal therefrom shall be paid by the Corporation in advance of the final disposition of such matter; provided, however, that the payment of such expenses incurred by or

on behalf of Indemnitee in advance of the final disposition of such matter shall be made only upon receipt of an undertaking by or on behalf of Indemnitee to repay all amounts so advanced in the event that it shall ultimately be determined by final judicial decision from which there is no further right to appeal that Indemnitee is not entitled to be indemnified by the Corporation as authorized in this Article EIGHTH; and provided further that no such advancement of expenses shall be made under this Article EIGHTH if it is determined (in the manner described in Section 6) that (i) Indemnitee did not act in good faith and in a manner he or she reasonably believed to be in, or not opposed to, the best interests of the Corporation, or (ii) with respect to any criminal action or proceeding, Indemnitee had reasonable cause to believe his or her conduct was unlawful. Such undertaking shall be accepted without reference to the financial ability of Indemnitee to make such repayment.

6. Procedure for Indemnification and Advancement of Expenses. In order to obtain indemnification or advancement of expenses pursuant to Section 1, 2, 3 or 5 of this Article EIGHTH, an Indemnitee shall submit to the Corporation a written request. Any such advancement of expenses shall be made promptly, and in any event within 60 days after receipt by the Corporation of the written request of Indemnitee, unless (i) the Corporation has assumed the defense pursuant to Section 4 of this Article EIGHTH (and none of the circumstances described in Section 4 of this Article EIGHTH that would nonetheless entitle the Indemnitee to indemnification for the fees and expenses of separate counsel have occurred) or (ii) the Corporation determines within such 60-day period that Indemnitee did not meet the applicable standard of conduct set forth in Section 1, 2 or 5 of this Article EIGHTH, as the case may be. Any such indemnification, unless ordered by a court, shall be made with respect to requests under Section 1 or 2 only as authorized in the specific case upon a determination by the Corporation that the indemnification of Indemnitee is proper because Indemnitee has met the applicable standard of conduct set forth in Section 1 or 2, as the case may be. Such determination shall be made in each instance (a) by a majority vote of the directors of the Corporation consisting of persons who are not at that time parties to the action, suit or proceeding in question ("disinterested directors"), whether or not a quorum, (b) by a committee of disinterested directors designated by majority vote of disinterested directors, whether or not a quorum, (c) if there are no disinterested directors, or if the disinterested directors so direct, by independent legal counsel (who may, to the extent permitted by law, be regular legal counsel to the Corporation) in a written opinion, or (d) by the stockholders of the Corporation.

7. Remedies. The right to indemnification or advancement of expenses as granted by this Article EIGHTH shall be enforceable by Indemnitee in any court of competent jurisdiction. Neither the failure of the Corporation to have made a determination prior to the commencement of such action that indemnification is proper in the circumstances because Indemnitee has met the applicable standard of conduct, nor an actual determination by the Corporation pursuant to Section 6 of this Article EIGHTH that Indemnitee has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that Indemnitee has not met the applicable standard of conduct. In any suit brought by Indemnitee to enforce a right to indemnification, or brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Corporation shall have the burden of proving that Indemnitee is not entitled to be indemnified, or to such advancement of expenses, under this Article EIGHTH. Indemnitee's expenses (including attorneys' fees) reasonably incurred in connection with successfully establishing Indemnitee's right to indemnification, in

whole or in part, in any such proceeding shall also be indemnified by the Corporation. Notwithstanding the foregoing, in any suit brought by Indemnitee to enforce a right to indemnification hereunder it shall be a defense that the Indemnitee has not met any applicable standard for indemnification set forth in the General Corporation Law of the State of Delaware.

8. Limitations. Notwithstanding anything to the contrary in this Article EIGHTH, except as set forth in Section 7 of this Article EIGHTH, the Corporation shall not indemnify an Indemnitee pursuant to this Article EIGHTH in connection with a proceeding (or part thereof) initiated by such Indemnitee unless the initiation thereof was approved by the Board of Directors of the Corporation. Notwithstanding anything to the contrary in this Article EIGHTH, the Corporation shall not indemnify an Indemnitee to the extent such Indemnitee is reimbursed from the proceeds of insurance, and in the event the Corporation makes any indemnification payments to an Indemnitee and such Indemnitee is subsequently reimbursed from the proceeds of insurance, such Indemnitee shall promptly refund indemnification payments to the Corporation to the extent of such insurance reimbursement.

9. Subsequent Amendment. No amendment, termination or repeal of this Article EIGHTH or of the relevant provisions of the General Corporation Law of the State of Delaware or any other applicable laws shall adversely affect or diminish in any way the rights of any Indemnitee to indemnification under the provisions hereof with respect to any action, suit, proceeding or investigation arising out of or relating to any actions, transactions or facts occurring prior to the final adoption of such amendment, termination or repeal.

10. Other Rights. The indemnification and advancement of expenses provided by this Article EIGHTH shall not be deemed exclusive of any other rights to which an Indemnitee seeking indemnification or advancement of expenses may be entitled under any law (common or statutory), agreement or vote of stockholders or disinterested directors or otherwise, both as to action in Indemnitee's official capacity and as to action in any other capacity while holding office for the Corporation, and shall continue as to an Indemnitee who has ceased to be a director or officer, and shall inure to the benefit of the estate, heirs, executors and administrators of Indemnitee. Nothing contained in this Article EIGHTH shall be deemed to prohibit, and the Corporation is specifically authorized to enter into, agreements with officers and directors providing indemnification rights and procedures different from those set forth in this Article EIGHTH. In addition, the Corporation may, to the extent authorized from time to time by its Board of Directors, grant indemnification rights to other employees or agents of the Corporation or other persons serving the Corporation and such rights may be equivalent to, or greater or less than, those set forth in this Article EIGHTH.

11. Partial Indemnification. If an Indemnitee is entitled under any provision of this Article EIGHTH to indemnification by the Corporation for some or a portion of the expenses (including attorneys' fees), liabilities, losses, judgments, fines (including excise taxes and penalties arising under the Employee Retirement Income Security Act of 1974) or amounts paid in settlement actually and reasonably incurred by or on behalf of Indemnitee in connection with any action, suit, proceeding or investigation and any appeal therefrom but not, however, for the total amount thereof, the Corporation shall nevertheless indemnify Indemnitee for the portion of such expenses (including attorneys' fees), liabilities, losses, judgments, fines (including excise

taxes and penalties arising under the Employee Retirement Income Security Act of 1974) or amounts paid in settlement to which Indemnitee is entitled.

12. Insurance. The Corporation may purchase and maintain insurance, at its expense, to protect itself and any director, officer, employee or agent of the Corporation or another corporation, partnership, joint venture, trust or other enterprise (including any employee benefit plan) against any expense, liability or loss incurred by him or her in any such capacity, or arising out of his or her status as such, whether or not the Corporation would have the power to indemnify such person against such expense, liability or loss under the General Corporation Law of the State of Delaware.

13. Savings Clause. If this Article EIGHTH or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, then the Corporation shall nevertheless indemnify each Indemnitee as to any expenses (including attorneys' fees), liabilities, losses, judgments, fines (including excise taxes and penalties arising under the Employee Retirement Income Security Act of 1974) and amounts paid in settlement in connection with any action, suit, proceeding or investigation, whether civil, criminal or administrative, including an action by or in the right of the Corporation, to the fullest extent permitted by any applicable portion of this Article EIGHTH that shall not have been invalidated and to the fullest extent permitted by applicable law.

14. Definitions. Terms used herein and defined in Section 145(h) and Section 145(i) of the General Corporation Law of the State of Delaware shall have the respective meanings assigned to such terms in such Section 145(h) and Section 145(i).

NINTH: In furtherance of and not in limitation of powers conferred by law, it is further provided:

1. General Powers of Board. The business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors.

2. Election of Directors. Election of directors need not be by written ballot, except as and to the extent provided in the By-laws of the Corporation.

TENTH: Stockholders of the Corporation may not take any action by written consent in lieu of a meeting. Notwithstanding any other provisions of law, this Restated Certificate of Incorporation or the Bylaws of the Corporation, and notwithstanding the fact that a lesser percentage may be specified by law, the affirmative vote of the holders of at least seventy-five percent (75%) of the votes which all the stockholders would be entitled to cast in any annual election of directors shall be required to amend or repeal, or to adopt any provision inconsistent with, this Article TENTH.

ELEVENTH: Special meetings of stockholders for any purpose or purposes may be called at any time by only the Board of Directors, the Chairman of the Board or the Chief Executive Officer, and may not be called by any other person or persons. Business transacted at any special meeting of stockholders shall be limited to matters relating to the purpose or purposes stated in the notice of meeting. Notwithstanding any other provisions of law, this Restated Certificate of Incorporation or the Bylaws of the Corporation, and notwithstanding the

fact that a lesser percentage may be specified by law, the affirmative vote of the holders of at least seventy-five percent (75%) of the votes which all the stockholders would be entitled to cast in any annual election of directors shall be required to amend or repeal, or to adopt any provision inconsistent with, this Article ELEVENTH.

[Remainder of Page Intentionally Left Blank.]

IN WITNESS WHEREOF, this Restated Certificate of Incorporation, which restates, integrates and amends the restated certificate of incorporation of the Corporation, and which has been duly adopted in accordance with Sections 228, 242 and 245 of the General Corporation Law of the State of Delaware, has been executed by its duly authorized officer this 3rd day of April, 2012.

MERRIMACK PHARMACEUTICALS, INC.

By:/s/ Robert J. Mulroy
Robert J. Mulroy
President and Chief Executive Officer

CERTIFICATE OF AMENDMENT TO

RESTATED CERTIFICATE OF INCORPORATION

OF

MERRIMACK PHARMACEUTICALS, INC.

(Pursuant to Section 242 of the
General Corporation Law of the State of Delaware)

Merrimack Pharmaceuticals, Inc. (the "Corporation"), a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware, does hereby certify as follows:

A resolution was duly adopted by the Board of Directors of the Corporation pursuant to Section 242 of the General Corporation Law of the State of Delaware setting forth a proposed amendment to the Restated Certificate of Incorporation of the Corporation and declaring said amendment to be advisable. The stockholders of the Corporation duly approved said proposed amendment in accordance with Section 242 of the General Corporation Law of the State of Delaware. The resolution setting forth the amendment is as follows:

RESOLVED: That the first paragraph of Article FOURTH of the Restated Certificate of Incorporation of the Corporation be and hereby is deleted in its entirety and the following is inserted in lieu thereof:

"**FOURTH:** That, at 5:00 p.m., Eastern Time, on the date of filing this Certificate of Amendment to the Restated Certificate of Incorporation with the Secretary of State of the State of Delaware (the "Effective Time"), a one-for-ten reverse stock split of the Corporation's common stock, $0.01 par value per share (the "Common Stock"), shall become effective, pursuant to which each ten shares of Common Stock issued or outstanding (including treasury shares) immediately prior to the Effective Time shall be reclassified and combined into one validly issued, fully paid and nonassessable share of Common Stock automatically and without any action by the Corporation or the holder thereof upon the Effective Time and shall represent one share of Common Stock from and after the Effective Time (such reclassification and combination of shares, the "Reverse Stock Split"). The par value of the Common Stock following the Reverse Stock Split shall remain at $0.01 per share. No fractional shares of Common Stock shall be issued as a result of the Reverse Stock Split and, in lieu thereof, upon surrender after the Effective Time of a certificate which formerly represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time, any person who would otherwise be entitled to a fractional share of Common Stock as a

result of the Reverse Stock Split, following the Effective Time, shall be entitled to receive a cash payment (without interest) equal to the fraction of a share of Common Stock to which such holder would otherwise be entitled multiplied by the fair value per share of the Common Stock immediately prior to the Effective Time as determined by the Board of Directors of the Corporation.

Each stock certificate that, immediately prior to the Effective Time, represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time shall, from and after the Effective Time, automatically and without the necessity of presenting the same for exchange, represent that number of whole shares of Common Stock after the Effective Time into which the shares formerly represented by such certificate have been reclassified (as well as the right to receive cash in lieu of fractional shares of Common Stock as set forth above); provided, however, that each person of record holding a certificate that represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time shall receive, upon surrender of such certificate, a new certificate evidencing and representing the number of whole shares of Common Stock after the Effective Time into which the shares of Common Stock formerly represented by such certificate shall have been reclassified.

The total number of shares of all classes of stock which the Corporation shall have the authority to issue is 30,000,000 shares, consisting of (i) 20,000,000 shares of Common Stock and (ii) 10,000,000 shares of Preferred Stock, $0.01 par value per share ("Preferred Stock")."

***

IN WITNESS WHEREOF, this Certificate of Amendment has been executed by a duly authorized officer of the Corporation on this 5th day of September, 2017.

MERRIMACK PHARMACEUTICALS, INC.

By: /s/ Richard Peters
Richard Peters
President and Chief Executive Officer

Exhibit 10.1

EMPLOYMENT AGREEMENT

This Employment Agreement (this "Agreement"), dated as of July 18, 2017, is entered into by and between Merrimack Pharmaceuticals, Inc., a Delaware corporation with a place of business at One Kendall Square, Suite B7201, Cambridge, Massachusetts 02139 (the "Company"), and Thomas E. Needham, Jr. (the "Employee").

RECITALS

WHEREAS, the Company desires to employ the Employee on the terms and conditions, and for the consideration, hereinafter set forth, and the Employee desires to be employed by the Company on such terms and conditions and for such consideration.

NOW, THEREFORE, in consideration of the foregoing and of the respective covenants and agreements of the parties herein contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1.*Term of Employment*. Subject to the terms and conditions hereinafter set forth, the Company hereby employs the Employee, and the Employee hereby enters into the employment of the Company, for an employment term commencing on July 24, 2017 (the "Effective Date") and, unless earlier terminated in accordance with the provisions set forth in Section 7, continuing until December 31, 2017. This Agreement shall renew automatically for successive one (1) year terms, unless either party shall give the other notice of non-renewal in accordance with Section 7. The initial term of this Agreement, together with any annual renewal terms of this Agreement, shall be referred to as the "Term of Employment." The Employee's Base Salary (as defined below) for any renewal term shall be as agreed by the parties, provided that (i) the Base Salary shall in no event be less than the Base Salary the Employee received in the immediately preceding term, and (ii) in the absence of an agreement otherwise, the Employee's Base Salary shall be the same as the Base Salary he received in the immediately preceding term.

2.*Position*. During the Term of Employment, the Employee shall serve as the Chief Business Officer of the Company and in such additional position(s) as he and the Company shall agree.

3.*Scope of Employment*. During the Term of Employment, the Employee shall be responsible for the performance of all financial, managerial and administrative duties customarily performed by a Chief Business Officer, together with such other duties as the Chief Executive Officer and the Employee shall agree. The Employee shall be accountable to the Chief Executive Officer and shall perform and discharge, faithfully, diligently and to the best of his ability, his duties and responsibilities hereunder. The Employee shall devote his full working time and efforts to the business and affairs of the Company and its affiliates.

4.*Compensation*. As full compensation for all services to be rendered by the Employee during the Term of Employment, the Company will provide to the Employee, and the Employee will accept, the following:

(a)*Base Salary.* During the Term of Employment, the Employee shall receive a base salary of $340,000 per calendar year, less all applicable taxes and withholdings (the "Base Salary"), paid in installments in accordance with the Company's regularly established payroll procedure. The Employee's Base Salary shall be reviewed annually by the Company's Board of Directors (the "Board") and may be adjusted from time to time in accordance with normal business practices and taking into account then-current market factors, but in no event shall the Employee's Base Salary be less than the Base Salary the Employee received from the Company in the immediately preceding year.

(b)*Annual Discretionary Bonus.* During the Term of Employment, the Employee shall be eligible to receive a discretionary annual performance and retention bonus of up to 35% of his then-current Base Salary, at a time and under circumstances determined by the Board, in its sole discretion. In order to receive this bonus, the Employee must be an active employee of the Company on the date any bonus is determined and no discretionary annual bonus shall be considered earned before such date. Such discretionary bonus, if any, shall be paid no later than sixty (60) days following the date on which the Board approves such bonus. The Employee's bonus for 2017 shall be prorated based on the Effective Date.

(c) *Stock Options; Equity Grants.* Subject to approval by the Board, the Company will grant the Employee an option to purchase 450,000 shares of the Company's common stock (as adjusted for any stock splits or combinations), with an exercise price equal to the fair market value per share on the date of the grant of the stock option. The stock option will vest over three years at the rate of 1/6th of the total number of shares granted on the six-month anniversary of the Effective Date and an additional 1/12th of the total number of shares granted at the end of each successive three month period following the six-month anniversary of the Effective Date until fully exercisable, subject to the Employee's continued employment with the Company on the applicable vesting date. This stock option shall be subject to the terms and conditions of the Company's 2011 Stock Incentive Plan and the applicable Stock Option Agreement. The Employee shall be eligible to receive additional option grants or other equity grants at times and under circumstances determined by the Board, in its sole discretion.

(d)*Paid Time Off.* The Employee shall be eligible for paid time off in accordance with the Company's Paid Time Off Policy contained within the Company's Employee Handbook, as amended and/or superseded from time to time.

(e)*Insurance.* The Employee shall be entitled to participate in, and receive benefits under, all Company sponsored insurance and benefit programs (i.e., health, dental, life, and disability) available to senior management employees of the Company, subject to and on a basis consistent with the eligibility requirements, terms, conditions and overall administration of such programs.

(f)*Other Benefits.* The Employee shall be entitled to participate in, and receive benefits under, all Company employee benefit plans and arrangements (including but not limited to 401(k) and similar programs), available to senior management employees of the Company, subject to and on a basis consistent with the eligibility requirements, terms, conditions and overall administration of such plans, policies and arrangements.

5.*Expenses*. The Employee shall be entitled to reimbursement by the Company for all reasonable expenses actually incurred by him on the Company's behalf in the performance of his duties during the course of his employment by the Company, upon the prompt presentation by the Employee, from time to time and in accordance with the Company's then-current reimbursement policies, of an itemized account of such expenditures together with all supporting vouchers and receipts. All expense reimbursements shall be subject to the terms set forth in Section 5 of Exhibit C.

6.*Restrictive Covenants/Other Conditions to Employment*. Notwithstanding anything to the contrary contained herein, the Employee's employment hereunder is subject to and conditioned on the Employee's (i) completion of a background check and drug screen analysis satisfactory to the Company, (ii) execution and delivery to the Company of the Non-Disclosure, Developments, Non-Competition and Non-Solicitation Agreement (the "Restrictive Covenants Agreement") attached hereto as Exhibit A, and (iii) timely providing proof of his right to work in the United States. The Employee further agrees that he shall sign all consents necessary to the accomplishment of any of the foregoing, and that, should he not satisfy the conditions set forth in this Section 6, he shall not commence employment and this Agreement shall be null and void, with no obligations owed to the Employee.

7.*Early Termination.*

(a)*Death and Disability.* In the event of the Employee's death during the Term of Employment, this Agreement shall terminate immediately. If, during the Term of Employment, the Employee shall be unable for a period of more than any three (3) consecutive months or for periods aggregating more than twenty-six (26) weeks in a twelve (12) month period to perform the services provided for herein as a result of any illness or disability, the Company may terminate the Employee's employment hereunder. The Employee shall be considered unable to perform the services provided for herein if and whenever the Company reasonably determines, based upon the results of a medical examination performed by a mutually agreed-upon professional, that he is mentally or physically incapable of performing his duties hereunder.

(b)*Termination for Cause.* The Employee may be terminated by the Company without notice for "Cause." The following, as determined by the Board in its reasonable judgment, shall constitute "Cause" for termination:

(i) *Failure to Perform Duties.* The Employee's material failure to perform (other than by reason of illness or disability) his duties to the Company, or his material negligence in the performance of his duties and/or responsibilities to the Company, provided that the Employee shall have had prior written notice and a reasonable opportunity of not less than thirty (30) days to correct any deficiency in such performance;

(ii) *Breach of Employment Agreement or Restrictive Covenants Agreement.* The Employee's material breach of this Agreement or the Restrictive Covenants Agreement;

(iii) *Misconduct.* The Employee's conviction for or plea of *nolo contendere* or guilty to any crime involving fraud, embezzlement or moral turpitude or any felony; or

(iv) *Harmful Conduct.* Any conduct of the Employee that is materially harmful to the business, interests or reputation of the Company, provided that the Employee shall have had prior written notice and a reasonable opportunity of not less than ten (10) days to correct any such conduct.

(c)*Termination By Company Without Cause*. The Employee may be terminated by the Company without "Cause" upon delivery of written notice to the Employee. In the event the Employee is terminated without "Cause," the Employee shall be entitled to receive the severance benefits set forth in Section 7(f) or 7(g), as applicable. The Company's decision not to renew the Term of Employment shall constitute a termination without "Cause."

(d)*Termination by the Employee for Good Reason.* This Agreement may be terminated by the Employee for "Good Reason" (as defined below), upon thirty (30) days' prior written notice to the Company specifying any and all circumstances the Employee believes to constitute the basis for Good Reason, provided that the Company shall have the opportunity to cure the asserted Good Reason within the thirty (30) day period. The Employee shall have "Good Reason" to terminate this Agreement in the event that the Company, without the express written consent of the Employee: (i) causes a material diminution of the Employee's authority, duties or responsibilities; (ii) materially breaches this Agreement, including, without limitation, by materially reducing the Employee's Base Salary; or (iii) relocates the Employee's place of business by more than thirty (30) miles from the Company's current Cambridge, Massachusetts office. Notwithstanding the foregoing, the Employee must give notice of his intention to resign within ninety (90) days after the occurrence of the grounds for termination for Good Reason, and resign within thirty (30) days after the expiration of the Company's thirty (30) day cure period referenced above, or grounds for termination for Good Reason due to the circumstances specified in the notice are irrevocably waived. In the event the Employee terminates his employment for Good Reason, the Employee shall be entitled to the severance benefits set forth in Section 7(f) or 7(g), as applicable.

(e)*Effect of Early Termination.* Except for a termination by the Company without "Cause" or by the Employee for "Good Reason," in the event of any early termination of the Term of Employment, the Company's obligations under this Agreement shall immediately cease and the Employee shall be entitled to only the Employee's Base Salary and employment benefits which have accrued and to which the Employee is entitled through the date of such termination, including any bonus that may have been awarded but not yet paid. These accrued salary and benefits shall be paid on or about the date of termination, but in no event later than thirty (30) day following the date of termination. The Employee shall not be entitled to any other compensation or consideration, including any bonus not yet awarded that the Employee may have been eligible for had his Term of Employment not ceased, except as otherwise set forth in this Section 7(e). In the event of an early termination of the Term of Employment due to the Employee's death or disability, as set forth in Section 7(a), the Employee (or his estate, in the event of his death) will be eligible to receive a pro rata bonus determined in the manner set forth

in the penultimate sentence of Section 7(f), which bonus shall be paid within thirty (30) days following the date of the Employee's termination.

(f)*Severance Benefits Prior to a Change in Control.* If the Term of Employment is terminated by the Company without "Cause" (as that term is defined in Section 7(b)) or by the Employee for "Good Reason" (as that term is defined in Section 7(d)), in each case prior to a Change in Control (as that term is defined in Exhibit B), the Employee shall be entitled to receive his Base Salary and all other employment benefits accrued through the effective date of such termination, which shall be paid on or about the date of termination, but in no event later than thirty (30) day following the date of termination. In addition, provided the Employee executes and allows to become binding a severance agreement and release of claims drafted by the Company and satisfactory to the Company and the Employee (the "Release"), then beginning on the first regularly scheduled payroll date that is the later of sixty (60) days following the date of termination and the date on which the Employee executes and allows to become binding the Release (such date, the "Payment Commencement Date"), for a period of twelve (12) months (the "Severance Period"), the Company shall: (i) pay to the Employee as severance pay his Base Salary in accordance with the Company's regularly established payroll procedure and (ii) pay for coverage under any medical benefit plans provided pursuant to Section 4(e), provided the Employee is eligible for and elects to continue receiving such benefits pursuant to the federal "COBRA" law, 29 U.S.C. § 1161 et. seq., and provided further that the Employee continues to pay the applicable share of the premium for such coverage that is paid by active and similarly situated employees who receive the same type of coverage. In addition, the Company shall pay to the Employee, on the Payment Commencement Date, a pro-rata bonus equal to (A) the average of the Employee's annual bonus payments over each of the three (3) years prior to the year of termination (or, if the Employee is an executive officer, such lesser period during which the Employee served as an executive officer of the Company), or, if such termination occurs prior to the award of the Employee's first annual bonus for 2017, the Employee's target annual bonus for 2017, multiplied by (B) a fraction, the numerator of which is the number of days during the year during which the Employee remained employed by the Company and the denominator of which is 365. The distribution of all severance benefits under this Section 7(f) shall be subject to the provisions of Exhibit C.

(g)*Severance Benefits After a Change in Control*. If the Term of Employment is terminated by the Company without "Cause" (as that term is defined in Section 7(b)) or by the Employee for "Good Reason" (as that term is defined in Section 7(d)), in each case within the eighteen (18) month period following a Change in Control (as that term is defined in Exhibit B), the Employee shall be entitled to receive his Base Salary and all other employment benefits accrued through the effective date of such termination, which shall be paid on or about the date of termination, but in no event later than thirty (30) day following the date of termination. In addition, provided the Employee executes and allows to become binding the Release, the Company shall: (i) pay to the Employee as severance pay on the Payment Commencement Date a lump sum amount equal to thirty-six (36) months of his Base Salary; (ii) pay to the Employee on the Payment Commencement Date a bonus equal to (A) three (3) multiplied by (B) the average of the Employee's annual bonus payments over each of the three (3) years prior to the year of termination (or, if the Employee is an executive officer, such lesser period during which the Employee served as an executive officer of the Company), or, if such termination occurs prior to the award of the Employee's first annual bonus for 2017, the

Employee's target annual bonus for 2017; (iii) accelerate the vesting of all outstanding Company stock options, restricted stock or other equity awards granted to the Employee; and (iv) pay for coverage under any medical benefit plans provided pursuant to Section 4(e) for a period of eighteen (18) months following the Employee's date of termination, provided the Employee is eligible for and elects to continue receiving such benefits pursuant to the federal "COBRA" law, 29 U.S.C. § 1161 et. seq., and provided further that the Employee continues to pay the applicable share of the premium for such coverage that is paid by active and similarly situated employees who receive the same type of coverage. The distribution of all severance benefits under this Section 7(g) shall be subject to the provisions of Exhibit C.

8.*Absence of Restrictions*. The Employee represents and warrants that he is not a party to any commitment or undertaking by which he is subject to any restriction or limitation upon his entering into this Agreement or performing the services required of him hereunder.

9.*Amendments*. Any amendment to this Agreement shall be made in writing and signed by the parties hereto.

10.*Applicable Law/Jury Trial Waiver*. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts (without reference to the conflict of laws provisions thereof). Any action, suit or other legal proceeding arising under or relating to any provision of this Agreement shall be commenced only in a court of the Commonwealth of Massachusetts (or, if appropriate, a federal court located within the Commonwealth of Massachusetts), and the Company and the Employee each consents to the jurisdiction of such a court. THE COMPANY AND THE EMPLOYEE EACH HEREBY IRREVOCABLY WAIVES ANY RIGHT TO A TRIAL BY JURY IN ANY ACTION, SUIT OR OTHER LEGAL PROCEEDING ARISING UNDER OR RELATING TO ANY PROVISION OF THIS AGREEMENT.

11.*Entire Agreement*. This Agreement, together with the Restrictive Covenants Agreement attached hereto as Exhibit A and executed as a condition of the Employee's employment, constitutes the entire agreement between the parties and supersedes all prior agreements and understandings, whether written or oral, relating to the subject matter of these agreements.

12.*Successors and Assigns*. This Agreement shall be binding upon and inure to the benefit of both parties and their respective successors and assigns, including any corporation with which or into which the Company may be merged or which may succeed to its assets or business; provided, however, that the obligations of the Employee are personal and shall not be assigned by him.

13.*Acknowledgment*. The Employee states and represents that he has had an opportunity to fully discuss and review the terms of this Agreement with an attorney. The Employee further states and represents that he has carefully read this Agreement, understands the contents herein, freely and voluntarily assents to all of the terms and conditions hereof, and signs his name of his own free act.

14.*Miscellaneous*.

(a)No delay or omission by the Company in exercising any right under this Agreement shall operate as a waiver of that or any other right. A waiver or consent given by the Company on any one occasion shall be effective only in that instance and shall not be construed as a bar to or waiver of any right on any other occasion.

(b)The captions of the sections of this Agreement are for convenience of reference only and in no way define, limit or affect the scope or substance of any section of this Agreement.

(c)In case any provision of this Agreement shall be invalid, illegal or otherwise unenforceable, the validity, legality and enforceability of the remaining provisions shall in no way be affected or impaired thereby.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

COMPANY:

MERRIMACK PHARMACEUTICALS, INC.

By: /s/ Richard Peters
Richard Peters
President and Chief Executive Officer

EMPLOYEE:
/s/ Thomas E. Needham, Jr.
Thomas E. Needham, Jr.

Exhibit A

Non-Disclosure, Developments, Non-Competition and Non-Solicitation Agreement

NON-DISCLOSURE, DEVELOPMENTS, NON-COMPETITION AND NON-SOLICITATION AGREEMENT

This Non-Disclosure, Developments, Non-Competition and Non-Solicitation Agreement (the "Agreement"), dated as of July 24, 2017, is entered into by and between Merrimack Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and Thomas E. Needham, Jr. (the "Employee").

In consideration of the Employee's employment with the Company and for other valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the Employee, the Employee hereby agrees as follows:

1.Condition of Employment.

The Employee acknowledges that his/her employment and the continuance of that employment with the Company is contingent upon his/her agreement to sign and adhere to the provisions of this Agreement. The Employee further acknowledges that the nature of the Company's business is such that protection of its proprietary and confidential information and goodwill with its customers and partners is critical to its survival and success.

2.Confidential Information.

(a)The Employee agrees that all information and know-how, whether or not in writing, of a private, secret or confidential nature concerning the Company and its operations and business or financial affairs (collectively, "Confidential Information") is and shall be the exclusive property of the Company. By way of illustration, but not limitation, Confidential Information may include models, systems, software and codes, or systems, software and codes in the course of development, or planned or proposed systems, software or codes, customer, prospect and supplier lists, contacts at or knowledge of customers or prospective customers, customer accounts and other customer financial information, strategic partners and/or collaborators, price lists and all other pricing, marketing and sales information, projections, results relating to the Company or any customer or supplier of the Company, databases, modules, products, programs, product improvements, product enhancements and/or developments, designs, specifications, processes, methods, techniques, operations, projects, plans, chemical compounds, chemical or biological materials, engineering data, clinical or technological data, research data, financial data, personnel information, and other confidential agreements or documents (including, without limitation, clinical trial protocols and unpublished patent applications). Except as otherwise permitted by Section 5, the Employee will not disclose any Confidential Information to others outside the Company or use the same for any unauthorized purposes without written approval by an officer of the Company, either during or at any time after his/her employment with the Company, unless and until such Confidential Information has become public knowledge without fault by the Employee. While employed by the Company, the Employee will use the Employee's best efforts to prevent publication or disclosure of any Confidential Information.

(b)The Employee agrees that all Company Property (as defined below), whether created by the Employee or others, that shall come into the Employee's custody or possession

shall be and is the sole and exclusive property of the Company to be used only in the performance of the Employee's duties for the Company. "Company Property" means any and all written, photographic or any other record containing Confidential Information and shall include, but not be limited to, all agreements, notes, disks, files, letters, memoranda, reports, records, lists, data, drawings, sketches, notebooks, program listings, specifications, software programs, software code, computers and other electronic equipment, documentation, or other equipment or materials of any nature and in any form, containing Confidential Information. Upon the earliest of the Employee's termination or a request from the Company, the Employee will return to the Company any and all Company Property in the Employee's custody or possession without retaining any copies thereof (including, without limitation, any electronic copy) and without using or allowing others to improperly use such Company Property.

(c)The Employee acknowledges that the Employee's obligations with regard to Confidential Information that are set out in Sections 2(a) and (b) extend to all information, know-how, records and tangible property of customers of the Company or suppliers to the Company or of any third party who may have disclosed or entrusted the same to the Company or to the Employee in the course of the Company's business.

3.Developments.

(a)The Employee will make full and prompt disclosure to the Company of all inventions, ideas, concepts, improvements, discoveries, methods, techniques, tools, formula, developments, enhancements, modifications, databases, processes, software and works of authorship, whether patentable or not, that are created, made, conceived or reduced to practice by the Employee or under the Employee's direction or jointly with others during the Employee's employment with the Company, whether or not during normal working hours or on the premises of the Company (all of which are collectively referred to in this Agreement as "Developments").

(b)The Employee agrees to assign and does hereby assign to the Company (or any person or entity designated by the Company) all of the Employee's right, title and interest in and to all Developments and all related intellectual property rights. Except as, and solely to the extent that, it may be necessary for the Employee to perform the Employee's duties and fulfill the Employee's obligations in the course of the Employee's employment with the Company, the Company does not grant the Employee, and the Employee agrees that he/she will not receive, any license or right to use any Development or related intellectual property right. The Employee hereby also waives all claims to moral rights in any Developments. However, this Section 3(b) shall not apply to Developments that do not relate to the present or planned business or research and development of the Company and that are made and conceived by the Employee not during normal working hours, not on the Company's premises and not using the Company's tools, devices, equipment or Confidential Information. This Section 3(b) also shall not apply to any inventions that the Employee conceived of prior to the Employee's employment with the Company, which invention(s) the Employee shall disclose on Exhibit A attached hereto. IF THERE ARE ANY SUCH INVENTIONS TO BE EXCLUDED UNDER THIS AGREEMENT, THE EMPLOYEE SHALL INITIAL HERE; OTHERWISE IT WILL BE DEEMED THAT THERE ARE NO SUCH EXCLUSIONS. ____ The Employee understands that, to the extent this Agreement shall be construed in accordance with the laws of any state that precludes the requirement in an employee agreement to assign certain classes of inventions made

by an employee, this Section 3(b) shall be interpreted not to apply to any invention that a court rules and/or the Company agrees falls within such classes. To the extent allowed by law, the Employee hereby grants to the Company an exclusive (even unto the Employee), irrevocable, fully paid up, worldwide license to make, use and sell any and all inventions for which assignment cannot be effected.

(c)The Employee agrees to cooperate fully with the Company, both during and after the Employee's employment with the Company, with respect to the procurement, maintenance and enforcement of all copyrights, trademarks, patents and other intellectual property rights (both in the United States and foreign countries) relating to any Development. The Employee shall sign all papers, including, without limitation, copyright applications, patent applications, declarations, oaths, formal assignments, assignment of priority rights and powers of attorney, that the Company may deem necessary or desirable in order to protect and enforce its rights and interests in any Development. The Employee further agrees that if the Company is unable, after reasonable effort, to secure the signature of the Employee on any such papers, any executive officer of the Company shall be entitled to execute any such papers as the agent and the attorney-in-fact of the Employee, and the Employee hereby irrevocably designates and appoints each executive officer of the Company as the Employee's agent and attorney-in-fact for all countries worldwide to execute any such papers on the Employee's behalf, and to take any and all actions as the Company may deem necessary or desirable in order to protect its rights and interests in any Development, under the conditions described in this sentence. Should the Company engage in litigation to enforce any such intellectual property rights, the Employee agrees to appear and testify at no charge, but at the Company's expense.

4.Non-Competition and Non-Solicitation.

(a)While the Employee is employed by the Company and for a period of twelve (12) months following the Employee's termination or cessation of employment for any reason (voluntarily or involuntarily), the Employee will not, directly or indirectly:

(i) engage in any business or enterprise (whether as an owner, partner, officer, employee, director, investor, lender, consultant, independent contractor or otherwise, except as the holder of not more than 1% of the combined voting power of the outstanding stock of a publicly held company) that is competitive with the Company's business, including, without limitation, any business or enterprise that develops, designs, produces, markets or sells any product or service competitive with any product or service developed, designed, produced, marketed or sold or planned to be developed, designed, produced, marketed or sold by the Company while the Employee was employed by the Company;

(ii) either alone or in association with others, recruit, solicit, hire or engage as an independent contractor, or attempt to recruit, solicit, hire or engage as an independent contractor, any person who was employed by the Company or engaged as an independent contractor for the Company at any time during the period of the Employee's employment with the Company, except for an individual whose employment with or service for the Company has been terminated for a period of six (6) months or longer; and/or

(iii) either alone or in association with others, service, solicit, divert or take away, or attempt to service, solicit, divert or take away, the business or patronage of any of the clients, customers or accounts, or prospective clients, customers or accounts, of the Company that were contacted, solicited or served by the Employee while the Employee was employed by the Company or about which the Employee had access to Confidential Information in the course of his/her employment with the Company.

(b)The geographic scope of this Section 4 shall extend to anywhere the Company or any of its subsidiaries is doing business, has done business or has plans to do business during the Employee's employment with the Company.

(c)If any restriction set forth in this Section 4 is found by any court of competent jurisdiction to be unenforceable because it extends for too long a period of time or over too great a range of activities or in too broad a geographic area, it shall be interpreted to extend only over the maximum period of time, range of activities or geographic area as to which it may be enforceable.

(d)The Employee agrees that during the non-competition and non-solicitation period, the Employee will give notice to the Company of each new job, contract assignment or other work (either as an employee, contractor or otherwise) the Employee plans to undertake a reasonable amount of time prior to beginning any such activity. The notice shall state the name and address of the individual, corporation, association or other entity or organization (the "Entity") for whom such activity is undertaken and the Employee's proposed business relationship or position with the Entity. The Employee further agrees to provide the Company with other pertinent non-confidential information concerning such business activity as the Company may reasonably request in order to determine the Employee's continued compliance with his/her obligations under this Agreement. During the non-competition and non-solicitation period, the Employee agrees to provide a copy of this Agreement to all person and Entities with whom the Employee seeks to be hired or do business before accepting employment or engagement with any of them.

(e)If the Employee violates any of the provisions of this Section 4, the Employee shall continue to be held by the restrictions set forth in this Section 4 until a period equal to the period of restriction has expired without any violation.

5.Scope of Disclosure Restrictions.

Nothing in this Agreement prohibits the Employee from communicating with government agencies about possible violations of federal, state or local laws or otherwise providing information to government agencies or participating in government agency investigations or proceedings. The Employee is not required to notify the Company of any such communications; provided, however, that nothing herein authorizes the disclosure of information the Employee obtained through a communication that was subject to the attorney-client privilege. Further, notwithstanding the Employee's confidentiality and nondisclosure obligations, the Employee is hereby advised as follows pursuant to the Defend Trade Secrets Act: "An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that (A) is made (i) in confidence to a Federal, State, or local government official,

either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. An individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual (A) files any document containing the trade secret under seal; and (B) does not disclose the trade secret, except pursuant to court order."

6.Other Agreements.

The Employee hereby represents that, except as the Employee has disclosed in writing to the Company, the Employee is not bound by the terms of any restrictive covenant agreement with any previous employer or other party relating to the non-disclosure of trade secret or confidential or proprietary information, non-competition and/or non-solicitation of customers, clients, employees or others. The Employee further represents that the Employee's performance of all the terms of this Agreement and as an employee of the Company does not and will not breach any such restrictive covenant agreement, and the Employee will not disclose to the Company or induce the Company to use any confidential or proprietary information or material belonging to any previous employer or others.

7.Employment At Will.

The Employee acknowledges that this Agreement does not constitute a contract of employment for any period of time and does not modify the at-will nature of the Employee's employment with the Company, pursuant to which both the Company and the Employee may terminate the employment relationship at any time, for any or no reason, with or without notice.

8.General Provisions.

(a) Equitable Relief. The Employee acknowledges that the restrictions contained in this Agreement are necessary for the protection of the business and goodwill of the Company and are considered by the Employee to be reasonable for such purpose. The Employee agrees that any breach or threatened breach of this Agreement may cause the Company substantial and irrevocable damage that is difficult to measure. Therefore, in the event of any such breach or threatened breach, the Employee agrees that the Company, in addition to such other remedies that may be available, shall have the right to seek specific performance and injunctive relief without posting a bond, as well as its reasonable attorneys' fees incurred as a result of any such breach or threatened breach. The Employee hereby waives the adequacy of a remedy at law as a defense to such relief.

(b)Change in Terms/Conditions of Employment. The Employee agrees that his/her obligations under this Agreement shall continue in full force and effect in the event that the Employee's job title, responsibilities, reporting structure, work location, compensation or other conditions of his/her employment with the Company change subsequent to the execution of this Agreement, without the need to execute a new agreement.

(c)No Conflict. The Employee represents that the execution and performance by the Employee of this Agreement does not and will not conflict with or breach the terms of any other agreement by which the Employee is bound.

(d)Severability. The invalidity or unenforceability of any provision of this Agreement shall not affect or impair the validity or enforceability of any other provision of this Agreement.

(e)Waiver. No delay or omission by the Company in exercising any right under this Agreement will operate as a waiver of that or any other right. A waiver or consent given by the Company on any one occasion is effective only in that instance and will not be construed as a bar to or waiver of any right on any other occasion. Any waiver of any provision hereof shall be in writing and signed by the Company.

(f)Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of both parties and their respective successors and assigns, including, without limitation, any corporation or entity with which or into which the Company may be merged or which may succeed to all or substantially all of its assets or business; provided, however, that the obligations of the Employee are personal and shall not be assigned by the Employee.

(g)Governing Law, Forum and Jurisdiction/Jury Trial Waiver. This Agreement shall be governed by and construed as a sealed instrument under and in accordance with the laws of the Commonwealth of Massachusetts without regard to conflict of laws provisions. Any action, suit or other legal proceeding that is commenced to resolve any matter arising under or relating to any provision of this Agreement shall be commenced only in a court of the Commonwealth of Massachusetts (or, if appropriate, a federal court located within Massachusetts), and the Company and the Employee each consents to the jurisdiction of such a court. **The Employee and the Company hereby expressly waive the right to a jury trial for any claim relating to his/her/its rights or obligations under this Agreement, or otherwise relating to the Employee's employment or separation from employment with the Company.**

(h)Captions. The captions of the sections of this Agreement are for convenience of reference only and in no way define, limit or affect the scope or substance of any section of this Agreement.

(i)Entire Agreement. This Agreement supersedes all prior agreements, written or oral, between the Employee and the Company relating to the subject matter of this Agreement. This Agreement may not be amended, modified, changed or discharged in whole or in part, except by an agreement in writing signed by the Employee and the Company.

THE EMPLOYEE ACKNOWLEDGES THAT HE/SHE HAS CAREFULLY READ THIS AGREEMENT AND UNDERSTANDS AND AGREES TO ALL OF THE PROVISIONS IN THIS AGREEMENT.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

COMPANY:

MERRIMACK PHARMACEUTICALS, INC.

By: /s/ Richard Peters
Richard Peters
President and Chief Executive Officer

EMPLOYEE:
/s/ Thomas E. Needham, Jr.
Thomas E. Needham, Jr.

Exhibit A

List of Prior Inventions and Original Works of Authorship

Title	Date	Identifying Number or Brief Description

Additional Sheets Attached

Signature of Employee:

Printed Name of Employee:

Date: _____

Exhibit B

Definition of Change in Control

A "Change in Control" shall occur upon any of the following events, provided, in each case, that such event constitutes a "change in control event" within the meaning of Treasury Regulation Section 1.409A-3(i)(5)(i):

(A) the acquisition by an individual, entity or group (within the meaning of Section 13(d)(3) or 14(d)(2) of the Securities Exchange Act of 1934, as amended (the "Exchange Act")) (a "Person") of beneficial ownership of any capital stock of the Company if, after such acquisition, such Person beneficially owns (within the meaning of Rule 13d-3 under the Exchange Act) 50% or more of either (x) the then-outstanding shares of common stock of the Company (the "Outstanding Company Common Stock") or (y) the combined voting power of the then-outstanding securities of the Company entitled to vote generally in the election of directors (the "Outstanding Company Voting Securities"); provided, however, that for purposes of this subsection (A), the following acquisitions shall not constitute a Change in Control: (1) any acquisition directly from the Company or (2) any acquisition by any corporation pursuant to a Business Combination (as defined below) which complies with clauses (x) and (y) of subsection (C) of this definition;

(B) a change in the composition of the Board that results in the Continuing Directors (as defined below) no longer constituting a majority of the Board (or, if applicable, the Board of Directors of a successor corporation to the Company), where the term "Continuing Director" means at any date a member of the Board (x) who was a member of the Board on the date of this Agreement or (y) who was nominated or elected subsequent to such date by at least a majority of the directors who were Continuing Directors at the time of such nomination or election or whose election to the Board was recommended or endorsed by at least a majority of the directors who were Continuing Directors at the time of such nomination or election; provided, however, that there shall be excluded from this clause (y) any individual whose initial assumption of office occurred as a result of an actual or threatened election contest with respect to the election or removal of directors or other actual or threatened solicitation of proxies or consents, by or on behalf of a person other than the Board; or

(C) the consummation of a merger, consolidation, reorganization, recapitalization or share exchange involving the Company or a sale or other disposition of all or substantially all of the assets of the Company (a "Business Combination"), unless, immediately following such Business Combination, each of the following two conditions is satisfied: (x) all or substantially all of the individuals and entities who were the beneficial owners of the Outstanding Company Common Stock and Outstanding Company Voting Securities immediately prior to such Business Combination beneficially own, directly or indirectly, more than 50% of the then-outstanding shares of common stock and the combined voting power of the then-outstanding securities entitled to vote generally in the election of directors, respectively, of the resulting or acquiring corporation in such Business Combination (which shall include, without limitation, a corporation which as a result of such transaction owns the Company or substantially all of the Company's assets either directly or through one or more subsidiaries) (such resulting or acquiring

corporation is referred to herein as the "Acquiring Corporation") in substantially the same proportions as their ownership of the Outstanding Company Common Stock and Outstanding Company Voting Securities, respectively, immediately prior to such Business Combination and (y) no Person (excluding any employee benefit plan (or related trust) maintained or sponsored by the Company or by the Acquiring Corporation) beneficially owns, directly or indirectly, 50% or more of the then-outstanding shares of common stock of the Acquiring Corporation, or of the combined voting power of the then-outstanding securities of such corporation entitled to vote generally in the election of directors (except to the extent that such ownership existed prior to the Business Combination).

Exhibit C

Payments Subject to Section 409A

Subject to this Exhibit C, severance payments or benefits under this Agreement shall begin only on or after the date of the Employee's "separation from service" (determined as set forth below), which occurs on or after the termination of the Employee's employment. The following rules shall apply with respect to distribution of the payments and benefits, if any, to be provided to the Employee under this Agreement:

1.It is intended that each installment of the payments provided under this Agreement shall be treated as a separate "payment" for purposes of Section 409A of the Internal Revenue Code and the guidance issued thereunder ("Section 409A"). Neither the Company nor the Employee shall have the right to accelerate or defer the delivery of any such payments or benefits except to the extent specifically permitted or required by Section 409A.

2.If, as of the date of the Employee's "separation from service" from the Company, the Employee is not a "specified employee" (within the meaning of Section 409A), then each installment of the severance payments and benefits shall be made on the dates and terms set forth in this Agreement.

3.If, as of the date of the Employee's "separation from service" from the Company, the Employee is a "specified employee" (within the meaning of Section 409A), then:

(a) Each installment of the severance payments and benefits due under this Agreement that, in accordance with the dates and terms set forth herein, will in all circumstances, regardless of when the Employee's separation from service occurs, be paid within the Short-Term Deferral Period (as defined under Section 409A) shall be treated as a short-term deferral within the meaning of Treasury Regulation Section 1.409A- l(b)(4) to the maximum extent permissible under Section 409A and shall be paid at the time set forth in this Agreement; and

(b) Each installment of the severance payments and benefits due under this Agreement that is not described in this Exhibit C, Section 3(a) and that would, absent this subsection, be paid within the six (6) month period following the Employee's "separation from service" from the Company shall not be paid until the date that is six (6) months and one (1) day after such separation from service (or, if earlier, the Employee's death), with any such installments that are required to be delayed being accumulated during the six (6) month period and paid in a lump sum on the date that is six (6) months and one (1) day following the Employee's separation from service and any subsequent installments, if any, being paid in accordance with the dates and terms set forth in this Agreement; provided, however, that the preceding provisions of this sentence shall not apply to any installment of severance payments and benefits if and to the maximum extent that such installment is deemed to be paid under a separation pay plan that does not provide for a deferral of compensation by reason of the application of Treasury Regulation 1.409A-l(b)(9)(iii) (relating to separation pay upon an involuntary separation from service). Any installments that qualify for the exception under Treasury Regulation Section 1.409A-l(b)(9)(iii) must be paid no later than the last day of the Employee's second taxable year following the taxable year in which the separation from service

occurs.

4.The determination of whether and when the Employee's separation from service from the Company has occurred shall be made in a manner consistent with, and based on the presumptions set forth in, Treasury Regulation Section 1.409A-l(h). Solely for purposes of this Exhibit C, Section 4, "Company" shall include all persons with whom the Company would be considered a single employer under Section 414(b) and 414(c) of the Internal Revenue Code.

5.All reimbursements and in-kind benefits provided under this Agreement shall be made or provided in accordance with the requirements of Section 409A to the extent that such reimbursements or in-kind benefits are subject to Section 409A, including, where applicable, the requirement that (i) any reimbursement is for expenses incurred during the Employee's lifetime (or during a shorter period of time specified in this Agreement), (ii) the amount of expenses eligible for reimbursement during a calendar year may not affect the expenses eligible for reimbursement in any other calendar year, (iii) the reimbursement of an eligible expense will be made on or before the last day of the calendar year following the year in which the expense is incurred and (iv) the right to reimbursement is not subject to set off or liquidation or exchange for any other benefit.

6.The Company makes no representation or warranty and shall have no liability to the Employee or to any other person if any of the provisions of this Agreement (including this Exhibit C) are determined to constitute deferred compensation subject to Section 409A but that do not satisfy an exemption from, or the conditions of, that section.

7. The Company may withhold (or cause to be withheld) from any payments made under this Agreement, all federal, state, city or other taxes as shall be required to be withheld pursuant to any law or governmental regulation or ruling.

Exhibit 10.2

EMPLOYMENT AGREEMENT

This Employment Agreement (this "Agreement"), dated as of August 10, 2017, is entered into by and between Merrimack Pharmaceuticals, Inc., a Delaware corporation with a place of business at One Kendall Square, Suite B7201, Cambridge, Massachusetts 02139 (the "Company"), and Jean M. Franchi (the "Employee").

RECITALS

WHEREAS, the Company desires to employ the Employee on the terms and conditions, and for the consideration, hereinafter set forth, and the Employee desires to be employed by the Company on such terms and conditions and for such consideration.

NOW, THEREFORE, in consideration of the foregoing and of the respective covenants and agreements of the parties herein contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1.*Term of Employment*. Subject to the terms and conditions hereinafter set forth, the Company hereby employs the Employee, and the Employee hereby enters into the employment of the Company, for an employment term commencing on August 21, 2017 (the "Effective Date") and, unless earlier terminated in accordance with the provisions set forth in Section 7, continuing until December 31, 2017. This Agreement shall renew automatically for successive one (1) year terms, unless either party shall give the other notice of non-renewal in accordance with Section 7. The initial term of this Agreement, together with any annual renewal terms of this Agreement, shall be referred to as the "Term of Employment." The Employee's Base Salary (as defined below) for any renewal term shall be as agreed by the parties, provided that (i) the Base Salary shall in no event be less than the Base Salary the Employee received in the immediately preceding term, and (ii) in the absence of an agreement otherwise, the Employee's Base Salary shall be the same as the Base Salary she received in the immediately preceding term.

2.*Position*. During the Term of Employment, the Employee shall serve as the Chief Financial Officer of the Company and in such additional position(s) as she and the Company shall agree.

3.*Scope of Employment*. During the Term of Employment, the Employee shall be responsible for the performance of all financial, managerial and administrative duties customarily performed by a Chief Financial Officer, together with such other duties as the Chief Executive Officer and the Employee shall agree. The Employee shall be accountable to the Chief Executive Officer and shall perform and discharge, faithfully, diligently and to the best of her ability, her duties and responsibilities hereunder. The Employee shall devote her full working time and efforts to the business and affairs of the Company and its affiliates.

4.*Compensation*. As full compensation for all services to be rendered by the Employee during the Term of Employment, the Company will provide to the Employee, and the Employee will accept, the following:

(a)*Base Salary.* During the Term of Employment, the Employee shall receive a base salary of $400,000 per calendar year, less all applicable taxes and withholdings (the "Base Salary"), paid in installments in accordance with the Company's regularly established payroll procedure. The Employee's Base Salary shall be reviewed annually by the Company's Board of Directors (the "Board") and may be adjusted from time to time in accordance with normal business practices and taking into account then-current market factors, but in no event shall the Employee's Base Salary be less than the Base Salary the Employee received from the Company in the immediately preceding year.

(b)*Signing Bonus.* Contingent upon the commencement of the Employee's employment and subject to the terms and conditions set forth herein, the Company agrees to pay the Employee a one-time signing bonus of $100,000 (the "Signing Bonus"), less all applicable taxes and withholdings, which will be paid no later than the second pay period following the commencement of the Employee's employment. If prior to the one-year anniversary of the Effective Date the Employee voluntarily terminates her employment with the Company without Good Reason (as defined below) or the Company terminates the Employee's employment for Cause (as defined below), the Employee will be obligated to repay to the Company within sixty (60) days following her last day of employment with the Company the entire net amount of the Signing Bonus received by her.

(c)*Annual Discretionary Bonus.* During the Term of Employment, the Employee shall be eligible to receive a discretionary annual performance and retention bonus of up to 35% of her then-current Base Salary, at a time and under circumstances determined by the Board, in its sole discretion. In order to receive this bonus, the Employee must be an active employee of the Company on the date any bonus is determined and no discretionary annual bonus shall be considered earned before such date. Such discretionary bonus, if any, shall be paid no later than sixty (60) days following the date on which the Board approves such bonus. The Employee's bonus for 2017 shall be prorated based on the Effective Date.

(d) *Stock Options; Equity Grants.* Subject to approval by the Board, the Company will grant the Employee an option to purchase 450,000 shares of the Company's common stock (as adjusted for any stock splits or combinations), with an exercise price equal to the fair market value per share on the date of the grant of the stock option. The stock option will vest over three years at the rate of 1/6th of the total number of shares granted on the six-month anniversary of the Effective Date and an additional 1/12th of the total number of shares granted at the end of each successive three month period following the six-month anniversary of the Effective Date until fully exercisable, subject to the Employee's continued employment with the Company on the applicable vesting date. This stock option shall be subject to the terms and conditions of the Company's 2011 Stock Incentive Plan and the applicable Stock Option Agreement. The Employee shall be eligible to receive additional option grants or other equity grants at times and under circumstances determined by the Board, in its sole discretion.

(e)*Paid Time Off.* The Employee shall be eligible for paid time off in accordance with the Company's Paid Time Off Policy contained within the Company's Employee Handbook, as amended and/or superseded from time to time.

(f)*Insurance.* The Employee shall be entitled to participate in, and receive benefits under, all Company sponsored insurance and benefit programs (i.e., health, dental, life, and disability) available to senior management employees of the Company, subject to and on a basis consistent with the eligibility requirements, terms, conditions and overall administration of such programs.

(g)*Other Benefits.* The Employee shall be entitled to participate in, and receive benefits under, all Company employee benefit plans and arrangements (including but not limited to 401(k) and similar programs), available to senior management employees of the Company, subject to and on a basis consistent with the eligibility requirements, terms, conditions and overall administration of such plans, policies and arrangements.

5.*Expenses*. The Employee shall be entitled to reimbursement by the Company for all reasonable expenses actually incurred by her on the Company's behalf in the performance of her duties during the course of her employment by the Company, upon the prompt presentation by the Employee, from time to time and in accordance with the Company's then-current reimbursement policies, of an itemized account of such expenditures together with all supporting vouchers and receipts. All expense reimbursements shall be subject to the terms set forth in Section 5 of Exhibit C.

6.*Restrictive Covenants/Other Conditions to Employment*. Notwithstanding anything to the contrary contained herein, the Employee's employment hereunder is subject to and conditioned on the Employee's (i) completion of a background check and drug screen analysis satisfactory to the Company, (ii) execution and delivery to the Company of the Non-Disclosure, Developments, Non-Competition and Non-Solicitation Agreement (the "Restrictive Covenants Agreement") attached hereto as Exhibit A, and (iii) timely providing proof of her right to work in the United States. The Employee further agrees that she shall sign all consents necessary to the accomplishment of any of the foregoing, and that, should she not satisfy the conditions set forth in this Section 6, she shall not commence employment and this Agreement shall be null and void, with no obligations owed to the Employee.

7.*Early Termination.*

(a)*Death and Disability.* In the event of the Employee's death during the Term of Employment, this Agreement shall terminate immediately. If, during the Term of Employment, the Employee shall be unable for a period of more than any three (3) consecutive months or for periods aggregating more than twenty-six (26) weeks in a twelve (12) month period to perform the services provided for herein as a result of any illness or disability, the Company may terminate the Employee's employment hereunder. The Employee shall be considered unable to perform the services provided for herein if and whenever the Company reasonably determines, based upon the results of a medical examination performed by a mutually agreed-upon professional, that she is mentally or physically incapable of performing her duties hereunder.

(b)*Termination for Cause.* The Employee may be terminated by the Company without notice for "Cause." The following, as determined by the Board in its reasonable judgment, shall constitute "Cause" for termination:

(i) *Failure to Perform Duties.* The Employee's material failure to perform (other than by reason of illness or disability) her duties to the Company, or her material negligence in the performance of her duties and/or responsibilities to the Company, provided that the Employee shall have had prior written notice and a reasonable opportunity of not less than thirty (30) days to correct any deficiency in such performance;

(ii) *Breach of Employment Agreement or Restrictive Covenants Agreement.* The Employee's material breach of this Agreement or the Restrictive Covenants Agreement;

(iii) *Misconduct.* The Employee's conviction for or plea of *nolo contendere* or guilty to any crime involving fraud, embezzlement or moral turpitude or any felony; or

(iv) *Harmful Conduct.* Any conduct of the Employee that is materially harmful to the business, interests or reputation of the Company, provided that the Employee shall have had prior written notice and a reasonable opportunity of not less than ten (10) days to correct any such conduct.

(c)*Termination By Company Without Cause*. The Employee may be terminated by the Company without "Cause" upon delivery of written notice to the Employee. In the event the Employee is terminated without "Cause," the Employee shall be entitled to receive the severance benefits set forth in Section 7(f) or 7(g), as applicable. The Company's decision not to renew the Term of Employment shall constitute a termination without "Cause."

(d)*Termination by the Employee for Good Reason.* This Agreement may be terminated by the Employee for "Good Reason" (as defined below), upon thirty (30) days' prior written notice to the Company specifying any and all circumstances the Employee believes to constitute the basis for Good Reason, provided that the Company shall have the opportunity to cure the asserted Good Reason within the thirty (30) day period. The Employee shall have "Good Reason" to terminate this Agreement in the event that the Company, without the express written consent of the Employee: (i) causes a material diminution of the Employee's authority, duties or responsibilities; (ii) materially breaches this Agreement, including, without limitation, by materially reducing the Employee's Base Salary; or (iii) relocates the Employee's place of business by more than thirty (30) miles from the Company's current Cambridge, Massachusetts office. Notwithstanding the foregoing, the Employee must give notice of her intention to resign within ninety (90) days after the occurrence of the grounds for termination for Good Reason, and resign within thirty (30) days after the expiration of the Company's thirty (30) day cure period referenced above, or grounds for termination for Good Reason due to the circumstances specified in the notice are irrevocably waived. In the event the Employee terminates her employment for Good Reason, the Employee shall be entitled to the severance benefits set forth in Section 7(f) or 7(g), as applicable.

(e)*Effect of Early Termination.* Except for a termination by the Company without "Cause" or by the Employee for "Good Reason," in the event of any early termination of the Term of Employment, the Company's obligations under this Agreement shall immediately cease and the Employee shall be entitled to only the Employee's Base Salary and employment

benefits which have accrued and to which the Employee is entitled through the date of such termination, including any bonus that may have been awarded but not yet paid. These accrued salary and benefits shall be paid on or about the date of termination. The Employee shall not be entitled to any other compensation or consideration, including any bonus not yet awarded that the Employee may have been eligible for had her Term of Employment not ceased, except as otherwise set forth in this Section 7(e). In the event of an early termination of the Term of Employment due to the Employee's death or disability, as set forth in Section 7(a), the Employee (or her estate, in the event of her death) will be eligible to receive a pro rata bonus determined in the manner set forth in the penultimate sentence of Section 7(f), which bonus shall be paid within thirty (30) days following the date of the Employee's termination.

(f)*Severance Benefits Prior to a Change in Control.* If the Term of Employment is terminated by the Company without "Cause" (as that term is defined in Section 7(b)) or by the Employee for "Good Reason" (as that term is defined in Section 7(d)), in each case prior to a Change in Control (as that term is defined in Exhibit B), the Employee shall be entitled to receive her Base Salary and all other employment benefits accrued through the effective date of such termination, which shall be paid on or about the date of termination. In addition, provided the Employee executes and allows to become binding a severance agreement and release of claims drafted by and satisfactory to the Company (the "Release") on or before the sixtieth (60th) day after the date of termination, then beginning on the first regularly scheduled payroll date that is sixty (60) days following the date of termination (such date, the "Payment Commencement Date"), for a period of twelve (12) months (the "Severance Period"), the Company shall: (i) pay to the Employee as severance pay her Base Salary in accordance with the Company's regularly established payroll procedure and (ii) pay for coverage under any medical benefit plans provided pursuant to Section 4(f), provided the Employee is eligible for and elects to continue receiving such benefits pursuant to the federal "COBRA" law, 29 U.S.C. § 1161 et. seq., and provided further that the Employee continues to pay the applicable share of the premium for such coverage that is paid by active and similarly situated employees who receive the same type of coverage. In addition, the Company shall pay to the Employee, on the Payment Commencement Date, a pro-rata bonus equal to (A) the average of the Employee's annual bonus payments over each of the three (3) years prior to the year of termination (or, if the Employee is an executive officer, such lesser period during which the Employee served as an executive officer of the Company), or, if such termination occurs prior to the award of the Employee's first annual bonus for 2017, the Employee's target annual bonus for 2017, multiplied by (B) a fraction, the numerator of which is the number of days during the year during which the Employee remained employed by the Company and the denominator of which is 365. The distribution of all severance benefits under this Section 7(f) shall be subject to the provisions of Exhibit C.

(g)*Severance Benefits After a Change in Control*. If the Term of Employment is terminated by the Company without "Cause" (as that term is defined in Section 7(b)) or by the Employee for "Good Reason" (as that term is defined in Section 7(d)), in each case within the eighteen (18) month period following a Change in Control (as that term is defined in Exhibit B), the Employee shall be entitled to receive her Base Salary and all other employment benefits accrued through the effective date of such termination, which shall be paid on or about the date of termination. In addition, provided the Employee executes and allows to become binding the Release on or before the Payment Commencement Date, the Company shall:

(i) pay to the Employee as severance pay on the Payment Commencement Date a lump sum amount equal to thirty-six (36) months of her Base Salary; (ii) pay to the Employee on the Payment Commencement Date a bonus equal to (A) three (3) multiplied by (B) the average of the Employee's annual bonus payments over each of the three (3) years prior to the year of termination (or, if the Employee is an executive officer, such lesser period during which the Employee served as an executive officer of the Company), or, if such termination occurs prior to the award of the Employee's first annual bonus for 2017, the Employee's target annual bonus for 2017; (iii) accelerate the vesting of all outstanding Company stock options, restricted stock or other equity awards granted to the Employee; and (iv) pay for coverage under any medical benefit plans provided pursuant to Section 4(f) for a period of eighteen (18) months following the Employee's date of termination, provided the Employee is eligible for and elects to continue receiving such benefits pursuant to the federal "COBRA" law, 29 U.S.C. § 1161 et. seq., and provided further that the Employee continues to pay the applicable share of the premium for such coverage that is paid by active and similarly situated employees who receive the same type of coverage. The distribution of all severance benefits under this Section 7(g) shall be subject to the provisions of Exhibit C.

8.*Absence of Restrictions*. The Employee represents and warrants that she is not a party to any commitment or undertaking by which she is subject to any restriction or limitation upon her entering into this Agreement or performing the services required of her hereunder.

9.*Amendments*. Any amendment to this Agreement shall be made in writing and signed by the parties hereto.

10.*Applicable Law/Jury Trial Waiver*. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts (without reference to the conflict of laws provisions thereof). Any action, suit or other legal proceeding arising under or relating to any provision of this Agreement shall be commenced only in a court of the Commonwealth of Massachusetts (or, if appropriate, a federal court located within the Commonwealth of Massachusetts), and the Company and the Employee each consents to the jurisdiction of such a court. THE COMPANY AND THE EMPLOYEE EACH HEREBY IRREVOCABLY WAIVES ANY RIGHT TO A TRIAL BY JURY IN ANY ACTION, SUIT OR OTHER LEGAL PROCEEDING ARISING UNDER OR RELATING TO ANY PROVISION OF THIS AGREEMENT.

11.*Entire Agreement*. This Agreement, together with the Restrictive Covenants Agreement attached hereto as Exhibit A and executed as a condition of the Employee's employment, constitutes the entire agreement between the parties and supersedes all prior agreements and understandings, whether written or oral, relating to the subject matter of these agreements.

12.*Successors and Assigns*. This Agreement shall be binding upon and inure to the benefit of both parties and their respective successors and assigns, including any corporation with which or into which the Company may be merged or which may succeed to its assets or business; provided, however, that the obligations of the Employee are personal and shall not be assigned by her.

13.*Acknowledgment*. The Employee states and represents that she has had an opportunity to fully discuss and review the terms of this Agreement with an attorney. The Employee further states and represents that she has carefully read this Agreement, understands the contents herein, freely and voluntarily assents to all of the terms and conditions hereof, and signs her name of her own free act.

14.*Miscellaneous*.

(a)No delay or omission by the Company in exercising any right under this Agreement shall operate as a waiver of that or any other right. A waiver or consent given by the Company on any one occasion shall be effective only in that instance and shall not be construed as a bar to or waiver of any right on any other occasion.

(b)The captions of the sections of this Agreement are for convenience of reference only and in no way define, limit or affect the scope or substance of any section of this Agreement.

(c)In case any provision of this Agreement shall be invalid, illegal or otherwise unenforceable, the validity, legality and enforceability of the remaining provisions shall in no way be affected or impaired thereby.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

COMPANY:

MERRIMACK PHARMACEUTICALS, INC.

By: /s/ Richard Peters
Richard Peters
President and Chief Executive Officer

EMPLOYEE:
/s/ Jean M. Franchi
Jean M. Franchi

Exhibit A

Non-Disclosure, Developments, Non-Competition and Non-Solicitation Agreement

NON-DISCLOSURE, DEVELOPMENTS, NON-COMPETITION AND NON-SOLICITATION AGREEMENT

This Non-Disclosure, Developments, Non-Competition and Non-Solicitation Agreement (the "Agreement"), dated as of August 21, 2017, is entered into by and between Merrimack Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and Jean M. Franchi (the "Employee").

In consideration of the Employee's employment with the Company and for other valuable consideration, the receipt and sufficiency of which are hereby acknowledged by the Employee, the Employee hereby agrees as follows:

1.Condition of Employment.

The Employee acknowledges that his/her employment and the continuance of that employment with the Company is contingent upon his/her agreement to sign and adhere to the provisions of this Agreement. The Employee further acknowledges that the nature of the Company's business is such that protection of its proprietary and confidential information and goodwill with its customers and partners is critical to its survival and success.

2.Confidential Information.

(a)The Employee agrees that all information and know-how, whether or not in writing, of a private, secret or confidential nature concerning the Company and its operations and business or financial affairs (collectively, "Confidential Information") is and shall be the exclusive property of the Company. By way of illustration, but not limitation, Confidential Information may include models, systems, software and codes, or systems, software and codes in the course of development, or planned or proposed systems, software or codes, customer, prospect and supplier lists, contacts at or knowledge of customers or prospective customers, customer accounts and other customer financial information, strategic partners and/or collaborators, price lists and all other pricing, marketing and sales information, projections, results relating to the Company or any customer or supplier of the Company, databases, modules, products, programs, product improvements, product enhancements and/or developments, designs, specifications, processes, methods, techniques, operations, projects, plans, chemical compounds, chemical or biological materials, engineering data, clinical or technological data, research data, financial data, personnel information, and other confidential agreements or documents (including, without limitation, clinical trial protocols and unpublished patent applications). Except as otherwise permitted by Section 5, the Employee will not disclose any Confidential Information to others outside the Company or use the same for any unauthorized purposes without written approval by an officer of the Company, either during or at any time after his/her employment with the Company, unless and until such Confidential Information has become public knowledge without fault by the Employee. While employed by the Company, the Employee will use the Employee's best efforts to prevent publication or disclosure of any Confidential Information.

(b)The Employee agrees that all Company Property (as defined below), whether created by the Employee or others, that shall come into the Employee's custody or possession

shall be and is the sole and exclusive property of the Company to be used only in the performance of the Employee's duties for the Company. "Company Property" means any and all written, photographic or any other record containing Confidential Information and shall include, but not be limited to, all agreements, notes, disks, files, letters, memoranda, reports, records, lists, data, drawings, sketches, notebooks, program listings, specifications, software programs, software code, computers and other electronic equipment, documentation, or other equipment or materials of any nature and in any form, containing Confidential Information. Upon the earliest of the Employee's termination or a request from the Company, the Employee will return to the Company any and all Company Property in the Employee's custody or possession without retaining any copies thereof (including, without limitation, any electronic copy) and without using or allowing others to improperly use such Company Property.

(c)The Employee acknowledges that the Employee's obligations with regard to Confidential Information that are set out in Sections 2(a) and (b) extend to all information, know-how, records and tangible property of customers of the Company or suppliers to the Company or of any third party who may have disclosed or entrusted the same to the Company or to the Employee in the course of the Company's business.

3.Developments.

(a)The Employee will make full and prompt disclosure to the Company of all inventions, ideas, concepts, improvements, discoveries, methods, techniques, tools, formula, developments, enhancements, modifications, databases, processes, software and works of authorship, whether patentable or not, that are created, made, conceived or reduced to practice by the Employee or under the Employee's direction or jointly with others during the Employee's employment with the Company, whether or not during normal working hours or on the premises of the Company (all of which are collectively referred to in this Agreement as "Developments").

(b)The Employee agrees to assign and does hereby assign to the Company (or any person or entity designated by the Company) all of the Employee's right, title and interest in and to all Developments and all related intellectual property rights. Except as, and solely to the extent that, it may be necessary for the Employee to perform the Employee's duties and fulfill the Employee's obligations in the course of the Employee's employment with the Company, the Company does not grant the Employee, and the Employee agrees that he/she will not receive, any license or right to use any Development or related intellectual property right. The Employee hereby also waives all claims to moral rights in any Developments. However, this Section 3(b) shall not apply to Developments that do not relate to the present or planned business or research and development of the Company and that are made and conceived by the Employee not during normal working hours, not on the Company's premises and not using the Company's tools, devices, equipment or Confidential Information. This Section 3(b) also shall not apply to any inventions that the Employee conceived of prior to the Employee's employment with the Company, which invention(s) the Employee shall disclose on Exhibit A attached hereto. IF THERE ARE ANY SUCH INVENTIONS TO BE EXCLUDED UNDER THIS AGREEMENT, THE EMPLOYEE SHALL INITIAL HERE; OTHERWISE IT WILL BE DEEMED THAT THERE ARE NO SUCH EXCLUSIONS. ____ The Employee understands that, to the extent this Agreement shall be construed in accordance with the laws of any state that precludes the requirement in an employee agreement to assign certain classes of inventions made

by an employee, this Section 3(b) shall be interpreted not to apply to any invention that a court rules and/or the Company agrees falls within such classes. To the extent allowed by law, the Employee hereby grants to the Company an exclusive (even unto the Employee), irrevocable, fully paid up, worldwide license to make, use and sell any and all inventions for which assignment cannot be effected.

(c)The Employee agrees to cooperate fully with the Company, both during and after the Employee's employment with the Company, with respect to the procurement, maintenance and enforcement of all copyrights, trademarks, patents and other intellectual property rights (both in the United States and foreign countries) relating to any Development. The Employee shall sign all papers, including, without limitation, copyright applications, patent applications, declarations, oaths, formal assignments, assignment of priority rights and powers of attorney, that the Company may deem necessary or desirable in order to protect and enforce its rights and interests in any Development. The Employee further agrees that if the Company is unable, after reasonable effort, to secure the signature of the Employee on any such papers, any executive officer of the Company shall be entitled to execute any such papers as the agent and the attorney-in-fact of the Employee, and the Employee hereby irrevocably designates and appoints each executive officer of the Company as the Employee's agent and attorney-in-fact for all countries worldwide to execute any such papers on the Employee's behalf, and to take any and all actions as the Company may deem necessary or desirable in order to protect its rights and interests in any Development, under the conditions described in this sentence. Should the Company engage in litigation to enforce any such intellectual property rights, the Employee agrees to appear and testify at no charge, but at the Company's expense.

4.Non-Competition and Non-Solicitation.

(a)While the Employee is employed by the Company and for a period of twelve (12) months following the Employee's termination or cessation of employment for any reason (voluntarily or involuntarily), the Employee will not, directly or indirectly:

(i) engage in any business or enterprise (whether as an owner, partner, officer, employee, director, investor, lender, consultant, independent contractor or otherwise, except as the holder of not more than 1% of the combined voting power of the outstanding stock of a publicly held company) that is competitive with the Company's business, including, without limitation, any business or enterprise that develops, designs, produces, markets or sells any product or service competitive with any product or service developed, designed, produced, marketed or sold or planned to be developed, designed, produced, marketed or sold by the Company while the Employee was employed by the Company;

(ii) either alone or in association with others, recruit, solicit, hire or engage as an independent contractor, or attempt to recruit, solicit, hire or engage as an independent contractor, any person who was employed by the Company or engaged as an independent contractor for the Company at any time during the period of the Employee's employment with the Company, except for an individual whose employment with or service for the Company has been terminated for a period of six (6) months or longer; and/or

(iii) either alone or in association with others, service, solicit, divert or take away, or attempt to service, solicit, divert or take away, the business or patronage of any of the clients, customers or accounts, or prospective clients, customers or accounts, of the Company that were contacted, solicited or served by the Employee while the Employee was employed by the Company or about which the Employee had access to Confidential Information in the course of his/her employment with the Company.

(b)The geographic scope of this Section 4 shall extend to anywhere the Company or any of its subsidiaries is doing business, has done business or has plans to do business during the Employee's employment with the Company.

(c)If any restriction set forth in this Section 4 is found by any court of competent jurisdiction to be unenforceable because it extends for too long a period of time or over too great a range of activities or in too broad a geographic area, it shall be interpreted to extend only over the maximum period of time, range of activities or geographic area as to which it may be enforceable.

(d)The Employee agrees that during the non-competition and non-solicitation period, the Employee will give notice to the Company of each new job, contract assignment or other work (either as an employee, contractor or otherwise) the Employee plans to undertake at least ten (10) business days prior to beginning any such activity. The notice shall state the name and address of the individual, corporation, association or other entity or organization (the "Entity") for whom such activity is undertaken and the Employee's proposed business relationship or position with the Entity. The Employee further agrees to provide the Company with other pertinent information concerning such business activity as the Company may reasonably request in order to determine the Employee's continued compliance with his/her obligations under this Agreement. During the non-competition and non-solicitation period, the Employee agrees to provide a copy of this Agreement to all person and Entities with whom the Employee seeks to be hired or do business before accepting employment or engagement with any of them.

(e)If the Employee violates any of the provisions of this Section 4, the Employee shall continue to be held by the restrictions set forth in this Section 4 until a period equal to the period of restriction has expired without any violation.

5.Scope of Disclosure Restrictions.

Nothing in this Agreement prohibits the Employee from communicating with government agencies about possible violations of federal, state or local laws or otherwise providing information to government agencies or participating in government agency investigations or proceedings. The Employee is not required to notify the Company of any such communications; provided, however, that nothing herein authorizes the disclosure of information the Employee obtained through a communication that was subject to the attorney-client privilege. Further, notwithstanding the Employee's confidentiality and nondisclosure obligations, the Employee is hereby advised as follows pursuant to the Defend Trade Secrets Act: "An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that (A) is made (i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or

investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. An individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual (A) files any document containing the trade secret under seal; and (B) does not disclose the trade secret, except pursuant to court order."

6.Other Agreements.

The Employee hereby represents that, except as the Employee has disclosed in writing to the Company, the Employee is not bound by the terms of any restrictive covenant agreement with any previous employer or other party relating to the non-disclosure of trade secret or confidential or proprietary information, non-competition and/or non-solicitation of customers, clients, employees or others. The Employee further represents that the Employee's performance of all the terms of this Agreement and as an employee of the Company does not and will not breach any such restrictive covenant agreement, and the Employee will not disclose to the Company or induce the Company to use any confidential or proprietary information or material belonging to any previous employer or others.

7.Employment At Will.

The Employee acknowledges that this Agreement does not constitute a contract of employment for any period of time and does not modify the at-will nature of the Employee's employment with the Company, pursuant to which both the Company and the Employee may terminate the employment relationship at any time, for any or no reason, with or without notice.

8.General Provisions.

(a) Equitable Relief. The Employee acknowledges that the restrictions contained in this Agreement are necessary for the protection of the business and goodwill of the Company and are considered by the Employee to be reasonable for such purpose. The Employee agrees that any breach or threatened breach of this Agreement will cause the Company substantial and irrevocable damage that is difficult to measure. Therefore, in the event of any such breach or threatened breach, the Employee agrees that the Company, in addition to such other remedies that may be available, shall have the right to specific performance and injunctive relief without posting a bond, as well as its reasonable attorneys' fees incurred as a result of any such breach or threatened breach. The Employee hereby waives the adequacy of a remedy at law as a defense to such relief.

(b)Change in Terms/Conditions of Employment. The Employee agrees that his/her obligations under this Agreement shall continue in full force and effect in the event that the Employee's job title, responsibilities, reporting structure, work location, compensation or other conditions of his/her employment with the Company change subsequent to the execution of this Agreement, without the need to execute a new agreement.

(c)No Conflict. The Employee represents that the execution and performance by the Employee of this Agreement does not and will not conflict with or breach the terms of any other agreement by which the Employee is bound.

(d)Severability. The invalidity or unenforceability of any provision of this Agreement shall not affect or impair the validity or enforceability of any other provision of this Agreement.

(e)Waiver. No delay or omission by the Company in exercising any right under this Agreement will operate as a waiver of that or any other right. A waiver or consent given by the Company on any one occasion is effective only in that instance and will not be construed as a bar to or waiver of any right on any other occasion. Any waiver of any provision hereof shall be in writing and signed by the Company.

(f)Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of both parties and their respective successors and assigns, including, without limitation, any corporation or entity with which or into which the Company may be merged or which may succeed to all or substantially all of its assets or business; provided, however, that the obligations of the Employee are personal and shall not be assigned by the Employee.

(g)Governing Law, Forum and Jurisdiction/Jury Trial Waiver. This Agreement shall be governed by and construed as a sealed instrument under and in accordance with the laws of the Commonwealth of Massachusetts without regard to conflict of laws provisions. Any action, suit or other legal proceeding that is commenced to resolve any matter arising under or relating to any provision of this Agreement shall be commenced only in a court of the Commonwealth of Massachusetts (or, if appropriate, a federal court located within Massachusetts), and the Company and the Employee each consents to the jurisdiction of such a court. **The Employee and the Company hereby expressly waive the right to a jury trial for any claim relating to his/her/its rights or obligations under this Agreement, or otherwise relating to the Employee's employment or separation from employment with the Company.**

(h)Captions. The captions of the sections of this Agreement are for convenience of reference only and in no way define, limit or affect the scope or substance of any section of this Agreement.

(i)Entire Agreement. This Agreement supersedes all prior agreements, written or oral, between the Employee and the Company relating to the subject matter of this Agreement. This Agreement may not be amended, modified, changed or discharged in whole or in part, except by an agreement in writing signed by the Employee and the Company.

THE EMPLOYEE ACKNOWLEDGES THAT HE/SHE HAS CAREFULLY READ THIS AGREEMENT AND UNDERSTANDS AND AGREES TO ALL OF THE PROVISIONS IN THIS AGREEMENT.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first written above.

COMPANY:

MERRIMACK PHARMACEUTICALS, INC.

By: /s/ Richard Peters
Richard Peters
President and Chief Executive Officer

EMPLOYEE:
/s/ Jean M. Franchi
Jean M. Franchi

Exhibit A

List of Prior Inventions and Original Works of Authorship

Title	Date	Identifying Number or Brief Description

Additional Sheets Attached

Signature of Employee:

Printed Name of Employee:

Date: _____

Exhibit B

Definition of Change in Control

A "Change in Control" shall occur upon any of the following events, provided, in each case, that such event constitutes a "change in control event" within the meaning of Treasury Regulation Section 1.409A-3(i)(5)(i):

(A) the acquisition by an individual, entity or group (within the meaning of Section 13(d)(3) or 14(d)(2) of the Securities Exchange Act of 1934, as amended (the "Exchange Act")) (a "Person") of beneficial ownership of any capital stock of the Company if, after such acquisition, such Person beneficially owns (within the meaning of Rule 13d-3 under the Exchange Act) 50% or more of either (x) the then-outstanding shares of common stock of the Company (the "Outstanding Company Common Stock") or (y) the combined voting power of the then-outstanding securities of the Company entitled to vote generally in the election of directors (the "Outstanding Company Voting Securities"); provided, however, that for purposes of this subsection (A), the following acquisitions shall not constitute a Change in Control: (1) any acquisition directly from the Company or (2) any acquisition by any corporation pursuant to a Business Combination (as defined below) which complies with clauses (x) and (y) of subsection (C) of this definition;

(B) a change in the composition of the Board that results in the Continuing Directors (as defined below) no longer constituting a majority of the Board (or, if applicable, the Board of Directors of a successor corporation to the Company), where the term "Continuing Director" means at any date a member of the Board (x) who was a member of the Board on the date of this Agreement or (y) who was nominated or elected subsequent to such date by at least a majority of the directors who were Continuing Directors at the time of such nomination or election or whose election to the Board was recommended or endorsed by at least a majority of the directors who were Continuing Directors at the time of such nomination or election; provided, however, that there shall be excluded from this clause (y) any individual whose initial assumption of office occurred as a result of an actual or threatened election contest with respect to the election or removal of directors or other actual or threatened solicitation of proxies or consents, by or on behalf of a person other than the Board; or

(C) the consummation of a merger, consolidation, reorganization, recapitalization or share exchange involving the Company or a sale or other disposition of all or substantially all of the assets of the Company (a "Business Combination"), unless, immediately following such Business Combination, each of the following two conditions is satisfied: (x) all or substantially all of the individuals and entities who were the beneficial owners of the Outstanding Company Common Stock and Outstanding Company Voting Securities immediately prior to such Business Combination beneficially own, directly or indirectly, more than 50% of the then-outstanding shares of common stock and the combined voting power of the then-outstanding securities entitled to vote generally in the election of directors, respectively, of the resulting or acquiring corporation in such Business Combination (which shall include, without limitation, a corporation which as a result of such transaction owns the Company or substantially all of the Company's assets either directly or through one or more subsidiaries) (such resulting or acquiring

corporation is referred to herein as the "Acquiring Corporation") in substantially the same proportions as their ownership of the Outstanding Company Common Stock and Outstanding Company Voting Securities, respectively, immediately prior to such Business Combination and (y) no Person (excluding any employee benefit plan (or related trust) maintained or sponsored by the Company or by the Acquiring Corporation) beneficially owns, directly or indirectly, 50% or more of the then-outstanding shares of common stock of the Acquiring Corporation, or of the combined voting power of the then-outstanding securities of such corporation entitled to vote generally in the election of directors (except to the extent that such ownership existed prior to the Business Combination).

Exhibit C

Payments Subject to Section 409A

Subject to this Exhibit C, severance payments or benefits under this Agreement shall begin only on or after the date of the Employee's "separation from service" (determined as set forth below), which occurs on or after the termination of the Employee's employment. The following rules shall apply with respect to distribution of the payments and benefits, if any, to be provided to the Employee under this Agreement:

1.It is intended that each installment of the payments provided under this Agreement shall be treated as a separate "payment" for purposes of Section 409A of the Internal Revenue Code and the guidance issued thereunder ("Section 409A"). Neither the Company nor the Employee shall have the right to accelerate or defer the delivery of any such payments or benefits except to the extent specifically permitted or required by Section 409A.

2.If, as of the date of the Employee's "separation from service" from the Company, the Employee is not a "specified employee" (within the meaning of Section 409A), then each installment of the severance payments and benefits shall be made on the dates and terms set forth in this Agreement.

3.If, as of the date of the Employee's "separation from service" from the Company, the Employee is a "specified employee" (within the meaning of Section 409A), then:

(a) Each installment of the severance payments and benefits due under this Agreement that, in accordance with the dates and terms set forth herein, will in all circumstances, regardless of when the Employee's separation from service occurs, be paid within the Short-Term Deferral Period (as defined under Section 409A) shall be treated as a short-term deferral within the meaning of Treasury Regulation Section 1.409A- l(b)(4) to the maximum extent permissible under Section 409A and shall be paid at the time set forth in this Agreement; and

(b) Each installment of the severance payments and benefits due under this Agreement that is not described in this Exhibit C, Section 3(a) and that would, absent this subsection, be paid within the six (6) month period following the Employee's "separation from service" from the Company shall not be paid until the date that is six (6) months and one (1) day after such separation from service (or, if earlier, the Employee's death), with any such installments that are required to be delayed being accumulated during the six (6) month period and paid in a lump sum on the date that is six (6) months and one (1) day following the Employee's separation from service and any subsequent installments, if any, being paid in accordance with the dates and terms set forth in this Agreement; provided, however, that the preceding provisions of this sentence shall not apply to any installment of severance payments and benefits if and to the maximum extent that such installment is deemed to be paid under a separation pay plan that does not provide for a deferral of compensation by reason of the application of Treasury Regulation 1.409A-l(b)(9)(iii) (relating to separation pay upon an involuntary separation from service). Any installments that qualify for the exception under Treasury Regulation Section 1.409A-l(b)(9)(iii) must be paid no later than the last day of the Employee's second taxable year following the taxable year in which the separation from service

occurs.

4.The determination of whether and when the Employee's separation from service from the Company has occurred shall be made in a manner consistent with, and based on the presumptions set forth in, Treasury Regulation Section 1.409A-l(h). Solely for purposes of this Exhibit C, Section 4, "Company" shall include all persons with whom the Company would be considered a single employer under Section 414(b) and 414(c) of the Internal Revenue Code.

5.All reimbursements and in-kind benefits provided under this Agreement shall be made or provided in accordance with the requirements of Section 409A to the extent that such reimbursements or in-kind benefits are subject to Section 409A, including, where applicable, the requirement that (i) any reimbursement is for expenses incurred during the Employee's lifetime (or during a shorter period of time specified in this Agreement), (ii) the amount of expenses eligible for reimbursement during a calendar year may not affect the expenses eligible for reimbursement in any other calendar year, (iii) the reimbursement of an eligible expense will be made on or before the last day of the calendar year following the year in which the expense is incurred and (iv) the right to reimbursement is not subject to set off or liquidation or exchange for any other benefit.

6.The Company makes no representation or warranty and shall have no liability to the Employee or to any other person if any of the provisions of this Agreement (including this Exhibit C) are determined to constitute deferred compensation subject to Section 409A but that do not satisfy an exemption from, or the conditions of, that section.

7. The Company may withhold (or cause to be withheld) from any payments made under this Agreement, all federal, state, city or other taxes as shall be required to be withheld pursuant to any law or governmental regulation or ruling.

Exhibit 31.1

CERTIFICATIONS

I, Richard Peters, M.D., Ph.D., certify that:

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

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

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

4. The registrant's other certifying officer 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.

Date: November 8, 2017

/s/ Richard Peters, M.D., Ph.D.
Richard Peters, M.D., Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATIONS

I, Jean M. Franchi, certify that:

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

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

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

4. The registrant's other certifying officer 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.

Date: November 8, 2017

/s/ Jean M. Franchi

Jean M. Franchi
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Merrimack Pharmaceuticals, Inc. (the "Company") for the period ended September 30, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Richard Peters, M.D., Ph.D., President and Chief Executive Officer of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, that to his knowledge:

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

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

Date: November 8, 2017

/s/ Richard Peters, M.D., Ph.D.
Richard Peters, M.D., Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Merrimack Pharmaceuticals, Inc. (the "Company") for the period ended September 30, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Jean M. Franchi, Chief Financial Officer of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, that to her knowledge:

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

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

Date: November 8, 2017

/s/ Jean M. Franchi
Jean M. Franchi
Chief Financial Officer
(Principal Financial Officer)