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, 2018

OR

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

For the transition period from to

Commission File Number 0-30739

INSMED INCORPORATED

(Exact name of registrant as specified in its charter)

Virginia	**54-1972729**
(State or other jurisdiction of incorporation or organization)	(I.R.S. employer identification no.)
10 Finderne Avenue, Building 10 **Bridgewater, New Jersey**	**08807**
(Address of principal executive offices)	(Zip Code)

(908) 977-9900

(Registrant's telephone number including area code)

Not Applicable

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

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

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

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

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

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

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

As of October 26, 2018, there were 77,090,229 shares of the registrant's common stock, $0.01 par value, outstanding.

INSMED INCORPORATED
FORM 10-Q
FOR THE QUARTER ENDED SEPTEMBER 30, 2018

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Unless the context otherwise indicates, references in this Form 10-Q to "Insmed Incorporated" refers to Insmed Incorporated, a Virginia corporation, and "Company," "Insmed," "we," "us" and "our" refer to Insmed Incorporated together with its consolidated subsidiaries. INSMED, ARIKAYCE, and CONVERT are trademarks of Insmed Incorporated. This Form 10-Q also contains trademarks of third parties. Each trademark of another company appearing in this Form 10-Q is the property of its owner.

PART I. FINANCIAL INFORMATION

ITEM 1. CONSOLIDATED FINANCIAL STATEMENTS

INSMED INCORPORATED
Consolidated Balance Sheets
(in thousands, except par value and share data)

	As of September 30, 2018 (unaudited)	As of December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$ 567,574	$ 381,165
Prepaid expenses and other current assets	9,921	8,279
Total current assets	577,495	389,444
Intangible assets	59,941	58,200
Fixed assets, net	19,526	12,432
Other assets	4,551	1,971
Total assets	$ 661,513	$ 462,047
Liabilities and shareholders' equity		
Current liabilities:		
Accounts payable	$ 16,579	$ 14,671
Accrued expenses	40,368	29,339
Other current liabilities	472	646
Total current liabilities	57,419	44,656
Long-term debt, net	311,861	55,567
Other long-term liabilities	826	765
Total liabilities	370,106	100,988
Shareholders' equity:		
Common stock, $0.01 par value; 500,000,000 authorized shares, 77,085,715 and 76,610,508 issued and outstanding shares at September 30, 2018 and December 31, 2017, respectively	771	766
Additional paid-in capital	1,481,205	1,318,181
Accumulated deficit	(1,190,589)	(957,885)
Accumulated other comprehensive income (loss)	20	(3)
Total shareholders' equity	291,407	361,059
Total liabilities and shareholders' equity	$ 661,513	$ 462,047

See accompanying notes to consolidated financial statements

INSMED INCORPORATED
Consolidated Statements of Comprehensive Loss (unaudited)
(in thousands, except per share data)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Revenues	$ —	$ —	$ —	$ —
Operating expenses:				
Research and development	39,538	26,675	105,358	75,800
General and administrative	44,445	17,408	114,258	47,767
Total operating expenses	83,983	44,083	219,616	123,567
Operating loss	(83,983)	(44,083)	(219,616)	(123,567)
Investment income	2,741	326	7,510	649
Interest expense	(6,675)	(1,496)	(18,805)	(4,459)
Loss on extinguishment of debt	—	—	(2,209)	—
Other income, net	220	101	550	206
Loss before income taxes	(87,697)	(45,152)	(232,570)	(127,171)
Provision for income taxes	46	27	134	94
Net loss	$ (87,743)	$ (45,179)	$ (232,704)	$ (127,265)
Basic and diluted net loss per share	$ (1.14)	$ (0.69)	$ (3.03)	$ (2.01)
Weighted average basic and diluted common shares outstanding	77,066	65,312	76,819	63,199
Net loss	$ (87,743)	$ (45,179)	$ (232,704)	$ (127,265)
Other comprehensive income:				
Foreign currency translation gains	2	76	23	99
Total comprehensive loss	$ (87,741)	$ (45,103)	$ (232,681)	$ (127,166)

See accompanying notes to consolidated financial statements

INSMED INCORPORATED
Consolidated Statements of Cash Flows (unaudited)
(in thousands)

	Nine Months Ended September 30,	
	2018	**2017**
Operating activities		
Net loss	$ (232,704)	$ (127,265)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	2,652	2,168
Stock-based compensation expense	20,205	13,332
Amortization of debt issuance costs	1,000	91
Accretion of debt discount	11,541	—
Accretion of back-end fee on debt	50	506
Changes in operating assets and liabilities:		
Prepaid expenses and other assets	(4,315)	(1,052)
Accounts payable	2,536	(921)
Accrued expenses and other	10,596	1,745
Net cash used in operating activities	(188,439)	(111,396)
Investing activities		
Purchase of fixed assets	(10,063)	(1,301)
Net cash used in investing activities	(10,063)	(1,301)
Financing activities		
Proceeds from exercise of stock options	6,390	2,953
Loss on extinguishment of debt	(2,209)	—
Payment of debt	(55,000)	—
Proceeds from issuance of 1.75% convertible senior notes due 2025	450,000	—
Payment of debt issuance costs	(14,235)	—
Proceeds from issuance of common stock, net	—	377,703
Net cash provided by financing activities	384,946	380,656
Effect of exchange rates on cash and cash equivalents	(35)	128
Net increase in cash and cash equivalents	186,409	268,087
Cash and cash equivalents at beginning of period	381,165	162,591
Cash and cash equivalents at end of period	$ 567,574	$ 430,678
Supplemental disclosures of cash flow information:		
Cash paid for interest	$ 4,975	$ 3,876
Cash paid for income taxes	$ 127	$ 62

See accompanying notes to consolidated financial statements

INSMED INCORPORATED
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS

1. The Company and Basis of Presentation

Insmed is a global biopharmaceutical company on a mission to transform the lives of patients with serious and rare diseases. The Company's first commercial product, ARIKAYCE (amikacin liposome inhalation suspension), received accelerated approval in the United States (US) on September 28, 2018 for the treatment of *Mycobacterium avium* complex (MAC) lung disease as part of a combination antibacterial drug regimen for adult patients with limited or no alternative treatment options. MAC lung disease is a rare and often chronic infection that can cause irreversible lung damage and can be fatal. The Company's clinical-stage pipeline includes INS1007 and INS1009. INS1007 is a novel oral, reversible inhibitor of dipeptidyl peptidase 1 (DPP1) with therapeutic potential in non-cystic fibrosis (non-CF) bronchiectasis and other inflammatory diseases. INS1009 is an inhaled formulation of a treprostinil prodrug that may offer a differentiated product profile for rare pulmonary disorders, including pulmonary arterial hypertension (PAH).

The Company was incorporated in the Commonwealth of Virginia on November 29, 1999 and its principal executive offices are in Bridgewater, New Jersey. The Company has legal entities in the US, Ireland, Germany, France, the United Kingdom (UK), the Netherlands, and Japan. All intercompany transactions and balances have been eliminated in consolidation.

The accompanying unaudited interim consolidated financial statements have been prepared pursuant to the rules and regulations for reporting on Form 10-Q. Accordingly, certain information and disclosures required by accounting principles generally accepted in the US for complete consolidated financial statements are not included herein. The unaudited interim consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto included in the Company’s Annual Report on Form 10-K for the year ended December 31, 2017.

The results of operations of any interim period are not necessarily indicative of the results of operations for the full year. The unaudited interim consolidated financial information presented herein reflects all normal adjustments that are, in the opinion of management, necessary for a fair statement of the financial position, results of operations and cash flows for the periods presented.

The Company had $567.6 million in cash and cash equivalents as of September 30, 2018 and reported a net loss of $232.7 million for the nine months ended September 30, 2018. Historically, the Company has funded its operations through public offerings of equity securities and debt financings. To date, the Company has not generated material revenue from ARIKAYCE. The Company commenced commercial shipments in October 2018. The Company expects to continue to incur operating losses while funding commercial launch efforts for ARIKAYCE, research and development (R&D) activities, regulatory submissions outside the US, and general and administrative expenses. The Company expects its future cash requirements to be substantial, and the Company may need to raise additional capital to fund operations, including the commercialization of ARIKAYCE and additional clinical trials related to ARIKAYCE, to develop INS1007 and INS1009 and to develop, acquire, in-license or co-promote other products that address orphan or rare diseases.

The source, timing and availability of any future financing or other transaction will depend principally upon continued progress in the Company’s commercial, regulatory and development activities. Any equity or debt financing will also be contingent upon equity and debt market conditions and interest rates at the time. If the Company is unable to obtain sufficient additional funds when required, the Company may be forced to delay, restrict or eliminate all or a portion of its development programs or commercialization efforts.

2. Summary of Significant Accounting Policies

The following are the required interim disclosure updates to the Company's significant accounting policies described in Note 2 of the notes to the consolidated financial statements in the Company’s Annual Report on Form 10-K for the year ended December 31, 2017:

Fair Value Measurements - The Company categorizes its financial assets and liabilities measured and reported at fair value in the financial statements on a recurring basis based upon the level of judgment associated with the inputs used to measure their fair value. Hierarchical levels, which are directly related to the amount of subjectivity associated with the inputs used to determine the fair value of financial assets and liabilities, are as follows:

- Level 1 — Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.
- Level 2 — Inputs (other than quoted prices included in Level 1) are either directly or indirectly observable for the assets or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.
- Level 3 — Inputs reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date. Consideration is given to the risk inherent in the valuation technique and the risk inherent in the inputs to the model.

Each major category of financial assets and liabilities measured at fair value on a recurring basis is categorized based upon the lowest level of significant input to the valuations. The fair value hierarchy also requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. Financial instruments in Level 1 generally include US treasuries and mutual funds listed in active markets.

The Company's only financial assets and liabilities which were measured at fair value as of September 30, 2018 and December 31, 2017 were Level 1 assets comprised of cash and cash equivalents of $567.6 million and $381.2 million, respectively. The estimated fair value of the liability component of the 1.75% convertible senior notes due 2025 (the Convertible Notes) (categorized as a Level 2 liability for fair value measurement purposes) was determined using current market factors and the ability of the Company to obtain debt on comparable terms to the Convertible Notes. The following table shows certain assets and liabilities and their carrying values and fair values:

	As of September 30, 2018	
	Carrying Value	Fair Value
	(in millions)	
Level 1		
Cash and cash equivalents	$ 567.6	$ 567.6
Level 2		
Convertible Notes ($450.0 face value)	$ 311.9 *	$ 381.6

* The carrying value of the Convertible Notes excludes $129.4 million of the unamortized portion of the debt discount.

The Company's cash and cash equivalents permit daily redemption and the fair values of these investments are based upon the quoted prices in active markets provided by the holding financial institutions. Cash equivalents consist of liquid investments with an original maturity of three months or less from the date of purchase. As of September 30, 2018, the Company's cash and cash equivalents balance included US treasury bills of $399.8 million.

The Company recognizes transfers between levels within the fair value hierarchy, if any, at the end of each quarter. There were no transfers in or out of Level 1, Level 2 or Level 3 during the nine months ended September 30, 2018 and 2017, respectively.

As of September 30, 2018 and December 31, 2017, the Company held no securities that were in an unrealized gain or loss position. The Company reviews the status of each security quarterly to determine whether an other-than-temporary impairment has occurred. In making its determination, the Company considers a number of factors, including: (1) the significance of the decline; (2) whether the securities were rated below investment grade; (3) how long the securities have been in an unrealized loss position; and (4) the Company's ability and intent to retain the investment for a sufficient period of time for it to recover.

Net Loss Per Share - Basic net loss per share is computed by dividing net loss by the weighted average number of common shares outstanding during the period. Diluted net loss per share is computed by dividing net loss by the weighted average number of common shares and other dilutive securities outstanding during the period. Potentially dilutive securities from stock options, restricted stock units (RSUs) and convertible debt securities would be anti-dilutive as the Company incurred a net loss. Potentially dilutive common shares resulting from the assumed exercise of outstanding stock options and from the assumed conversion of the Convertible Notes are determined based on the treasury stock method.

The following table sets forth the reconciliation of the weighted average number of common shares used to compute basic and diluted net loss per share for the three and nine months ended September 30, 2018 and 2017:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(in thousands, except per share amounts)			
Numerator:				
Net loss	$ (87,743)	$ (45,179)	$ (232,704)	$ (127,265)
Denominator:				
Weighted average common shares used in calculation of basic net loss per share:	77,066	65,312	76,819	63,199
Effect of dilutive securities:				
Common stock options	—	—	—	
RSUs	—	—	—	
Convertible debt securities	—	—	—	—
Weighted average common shares outstanding used in calculation of diluted net loss per share	77,066	65,312	76,819	63,199
Net loss per share:				
Basic and diluted	$ (1.14)	$ (0.69)	$ (3.03)	$ (2.01)

The following potentially dilutive securities have been excluded from the computations of diluted weighted average common shares outstanding as of September 30, 2018 and 2017 as their effect would have been anti-dilutive (in thousands):

	As of September 30,	
	2018	2017
Stock options to purchase common stock	9,608	8,601
Unvested RSUs	245	47
Convertible debt securities	11,492	—

Inventory - Inventory is stated at the lower of cost and net realizable value with cost determined on a standard costing method. The Company began capitalizing inventory costs subsequent to US Food and Drug Administration (FDA) approval of ARIKAYCE on September 28, 2018, when it was determined that the inventory had a probable future economic benefit. Inventory will be sold beginning in the fourth quarter of 2018 based on first-in, first out basis. Manufacturing variances, such as material usage variance and yield variance, will be capitalized in inventory until the respective units are sold at which point the variances will be released in cost of goods sold. The Company will periodically review inventory for expiry and obsolescence and write down accordingly. The Company performs quality control procedures throughout the manufacturing processes of ARIKAYCE; however, certain batches or units of ARIKAYCE may not meet quality specifications and result in a charge to cost of goods sold.

Prior to FDA approval of ARIKAYCE, the Company expensed all inventory related costs in the period incurred; therefore, inventory is not included in the September 30, 2018 consolidated balance sheet. Inventory used for clinical development purposes is expensed to research and development (R&D) expense when consumed.

Recently Adopted Accounting Pronouncements - In August 2016, the Financial Accounting Standards Board (FASB) issued Accounting Standard Update (ASU) 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments*, which addressed eight specific cash flow issues with the objective of reducing the existing diversity in practice. Among the updates, the standard requires debt extinguishment costs to be classified as cash outflows for financing activities. This standard update is effective as of the first quarter of 2018. As a result of the adoption of the standard, in the first quarter of 2018, the Company reported a $2.2 million loss on extinguishment of debt in the financing activities section of its consolidated statement of cash flows. The Company had no material debt extinguishment costs prior to the first quarter of 2018. The impact of adopting this standard was not material to the Company.

New Accounting Pronouncements (Not Yet Adopted)—In February 2016, the FASB issued ASU 2016-2, *Leases (Topic 842)* in order to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet for those leases classified as operating leases under previous generally accepted accounting principles. ASU 2016-2 requires a lessee to recognize a liability to make lease payments (the lease liability) and a right-of-use asset representing its right to use the underlying asset for the lease term on the balance sheet. ASU 2016-2 is effective for fiscal years beginning after December 15, 2018 (including interim periods within those periods) and early adoption is permitted. In August 2018, the FASB issued ASU 2018-11, *Targeted Improvements to ASC 842*, which provides a new transition option in which an entity initially applies ASU 2016-2 at the adoption date and recognizes a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. The Company will use the new transition option and is also utilizing the package of practical expedients that allows it to not reassess: (1) whether any expired or existing contracts are or contain leases, (2) lease classification for any expired or existing leases, and (3) initial direct costs for any expired or existing leases. The Company additionally expects to use the practical expedient that allows it to treat the lease and non-lease components of its leases as a single component. The Company has identified approximately ten leasing arrangements and is currently assessing the financial impact on the consolidated balance sheet. The Company expects to adopt ASU 2016-2 in the first quarter of 2019 and is in the process of evaluating the impact of adoption on its consolidated financial statements.

3. Intangible Assets

As of September 30, 2018, the Company's identifiable intangible assets consisted of acquired ARIKAYCE R&D, formerly referred to as in-process research and development, and a milestone payable to PARI Pharma GmbH (PARI) for the license to use PARI's Lamira™ Nebulizer System for the delivery of ARIKAYCE to patients. The total carrying value of the acquired ARIKAYCE R&D was $58.2 million as of September 30, 2018 and December 31, 2017, resulting from the initial amount recorded at the time of the Company's merger with Transave, Inc. (Transave) in 2010 and subsequent adjustments. On September 28, 2018, as a result of the FDA approval for ARIKAYCE, the Company recorded a milestone payment of $1.7 million due to PARI.

Intangible assets consist of the following:

	As of September 30, 2018	As of December 31, 2017
	(in thousands)	
Acquired ARIKAYCE R&D	$ 58,200	$ 58,200
PARI milestone upon FDA approval	1,741	—
Intangible assets	$ 59,941	$ 58,200

Intangible assets are measured at their respective fair values on the date they were recorded and, with respect to the Acquired ARIKAYCE milestone, at the date of subsequent adjustments of fair value. Intangible assets will be amortized beginning October 1, 2018 over the initial regulatory exclusivity period for ARIKAYCE (12 years). As of September 30, 2018, the Company performed a qualitative assessment on the assets. This assessment did not identify any indicators of impairment of the intangible assets and indicated that the implied value of the assets was more than 100% greater than the book value as of that date.

4. Accrued Expenses

Accrued expenses consist of the following:

	As of September 30, 2018	As of December 31, 2017
	(in thousands)	
Accrued clinical trial expenses	$ 6,576	$ 7,837
Accrued compensation	11,387	12,197
Accrued professional fees	10,746	4,500
Accrued technical operation expenses	5,137	2,182
Accrued milestone payment	1,741	—
Accrued interest payable	1,663	423
Accrued construction costs	2,069	1,719
Other accrued expenses	1,049	481
	$ 40,368	$ 29,339

5. Debt

In January 2018, the Company completed an underwritten public offering of the Convertible Notes, in which the Company sold $450.0 million aggregate principal amount of Convertible Notes, including the exercise in full of the underwriters' option to purchase additional Convertible Notes of $50.0 million. The Company's net proceeds from the offering, after deducting underwriting discounts and commissions and other offering expenses of $14.2 million, were approximately $435.8 million. The Convertible Notes bear interest payable semiannually in arrears on January 15 and July 15 of each year, beginning on July 15, 2018. The Convertible Notes mature on January 15, 2025, unless earlier converted, redeemed, or repurchased.

On or after October 15, 2024, until the close of business on the second scheduled trading day immediately preceding January 15, 2025, holders may convert their Convertible Notes at any time. Upon conversion, holders may receive cash, shares of the Company's common stock or a combination of cash and shares of the Company's common stock, at the Company's option. The initial conversion rate is 25.5384 shares of common stock per $1,000 principal amount of Convertible Notes (equivalent to an initial conversion price of approximately $39.16 per share of common stock). The conversion rate will be subject to adjustment in some events but will not be adjusted for any accrued and unpaid interest.

Holders may convert their Convertible Notes prior to October 15, 2024, only under the following circumstances, subject to the conditions set forth in an indenture, dated as of January 26, 2018, between the Company and Wells Fargo Bank, National Association (Wells Fargo), as trustee, as supplemented by the first supplemental indenture, dated January 26, 2018, between the Company and Wells Fargo (as supplemented, the Indenture): (i) during the five business day period immediately after any five consecutive trading day period (the measurement period) in which the trading price per $1,000 principal amount of convertible notes, as determined following a request by a holder of the 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 common stock and the conversion rate on such trading day, (ii) the Company elects to distribute to all or substantially all holders of the common stock (a) any rights, options or warrants (other than in connection with a stockholder rights plan for so long as the rights issued under such plan have not detached from the associated shares of common stock) entitling them, for a period of not more than 45 days from the declaration date for such distribution, to subscribe for or purchase shares of common stock at a price per share that is less than the average of the last reported sale prices of the common stock for the 10 consecutive trading day period ending on, and including, the trading day immediately preceding the declaration date for such distribution, or (b) the Company’s assets, debt securities or rights to purchase securities of the Company, which distribution has a per share value, as reasonably determined by the board of directors, exceeding 10% of the last reported sale price of the common stock on the trading day immediately preceding the declaration date for such distribution, (iii) if a transaction or event that constitutes a fundamental change or a make-whole fundamental change occurs, or if the Company is a party to (a) a consolidation, merger, combination, statutory or binding share exchange or similar transaction, pursuant to which the common stock would be converted into, or exchanged for, cash, securities or other property or assets, or (b) any sale, conveyance, lease or other transfer or similar transaction in one transaction or a series of transactions of all or substantially all of the consolidated assets of the Company and its subsidiaries, taken as a whole, all or any portion of the Convertible Notes may be surrendered by a holder for conversion at any time from or after the date that is 30 scheduled trading days prior to the anticipated effective date of the transaction, (iv) if during any calendar quarter commencing after the calendar quarter ending on March 31, 2018 (and only during such calendar quarter), the last reported sale price of the common stock for at least 20 trading days (whether or not consecutive) during the 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, or, (v) if the Company sends a notice of redemption, a holder may

surrender all or any portion of its Convertible Notes, to which the notice of redemption relates, for conversion at any time on or after the date the applicable notice of redemption was sent until the close of business on (a) the second business day immediately preceding the related redemption date or (b) if the Company fails to pay the redemption price on the redemption date as specified in such notice of redemption, such later date on which the redemption price is paid.

The Convertible Notes can be settled in cash, common stock, or a combination of cash and common stock at the Company's option, and thus, the Company determined the embedded conversion options in the convertible notes are not required to be separately accounted for as a derivative. However, since the Convertible Notes are within the scope of the accounting guidance for cash convertible instruments, the Company is required to separate the Convertible Notes into liability and equity components. The carrying amount of the liability component was calculated by measuring the fair value of a similar liability that does not have an associated equity component. The fair value was based on data from readily available pricing sources which utilize market observable inputs and other characteristics for similar types of instruments. The carrying amount of the equity component representing the embedded conversion option was determined by deducting the fair value of the liability component from the gross proceeds of the Convertible Notes. The excess of the principal amount of the liability component over its carrying amount is amortized to interest expense over the expected life of a similar liability that does not have an associated equity component using the effective interest method. The equity component is not remeasured as long as it continues to meet the conditions for equity classification in the accounting guidance for contracts in an entity's own equity. The fair value of the liability component of the Convertible Notes on the date of issuance was estimated at $309.1 million using an effective interest rate of 7.6%, and accordingly, the residual equity component on the date of issuance was $140.9 million. The discount is being amortized to interest expense over the term of the Convertible Notes and has a remaining period of approximately 6.28 years.

For the three and nine months ended September 30, 2018, total interest expense related to the Convertible Notes was $6.7 million and $17.9 million, respectively, which includes the contractual interest coupon payable semi-annually in cash, the amortization of the issuance costs, and accretion of debt discount, as described in the table below. The following table presents the carrying value of the Company's debt balance as of September 30, 2018 (in thousands):

1.75% convertible senior notes due 2025	$	450,000
Debt issuance costs, unamortized		(8,789)
Discount on debt		(129,350)
Long-term debt, net	$	311,861

As of September 30, 2018, future principal repayments of the debt for each of the fiscal years through maturity were as follows (in thousands):

Year Ending December 31:		
2018	$	—
2019		—
2020		—
2021		—
2022		—
2023 and thereafter		450,000
	$	450,000

In February 2018, the Company used part of the net proceeds from the issuance of the Convertible Notes to pay off its outstanding debt to Hercules Capital (Hercules). The payments to Hercules consisted of $55.0 million for the principal amount and an additional $3.2 million in back-end fees, outstanding interest, and prepayment penalty fees, which resulted in a $2.2 million loss on extinguishment of debt in the quarter ended March 31, 2018.

Interest Expense

The following table sets forth the total interest expense recognized in the periods presented (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Contractual interest expense	$ 1,971	$ 1,302	$ 6,214	$ 3,862
Amortization of debt issuance costs	415	30	1,000	91
Accretion of back-end fee on debt	—	164	50	506
Accretion of debt discount	4,289	—	11,541	—
Total interest expense	$ 6,675	$ 1,496	$ 18,805	$ 4,459

6. *Shareholders' Equity*

Common Stock — As of September 30, 2018, the Company had 500,000,000 shares of common stock authorized with a par value of $0.01 per share and 77,085,715 shares of common stock issued and outstanding. In addition, as of September 30, 2018, the Company had reserved 9,608,344 shares of common stock for issuance upon the exercise of outstanding stock options and 244,801 shares of common stock for issuance upon the vesting of RSUs. The Company has also reserved 11,492,280 shares of common stock for issuance upon conversion of the Convertible Notes, subject to adjustment in accordance with the Indenture.

In January 2018, the Company completed an underwritten public offering of $450.0 million aggregate principal amount of Convertible Notes, including the exercise in full of the underwriter's option to purchase additional Convertible Notes. The fair value of the liability component of the Convertible Notes on the date of issuance was estimated at $309.1 million, and accordingly, the equity component (included in additional paid-in capital) on the date of issuance was calculated as $140.9 million using the residual method, as further described in *Note 5 Debt*.

In September 2017, the Company completed an underwritten public offering of 14,123,150 shares of the Company's common stock, which included the underwriter's exercise in full of its over-allotment option of 1,842,150 shares, at a price to the public of $28.50 per share. The Company's net proceeds from the sale of the shares, after deducting the underwriter's discount and offering expenses of $24.8 million, were $377.7 million.

Preferred Stock — As of September 30, 2018, the Company had 200,000,000 shares of preferred stock authorized with a par value of $0.01 per share and no shares of preferred stock were issued and outstanding.

The following table summarizes the changes in total shareholders' equity for the nine months ended September 30, 2018 (in thousands):

Balance at December 31, 2017	$ 361,059
Net loss for the period	(232,704)
Proceeds from exercise of stock options	6,390
Equity component of Convertible Notes	136,434
Stock-based compensation expense	20,205
Change in cumulative translation adjustment	23
Balance at September 30, 2018	$ 291,407

7. *Stock-Based Compensation*

The Company's current equity compensation plan, the 2017 Incentive Plan, was approved by shareholders at the Company's Annual Meeting of Shareholders on May 18, 2017. The 2017 Incentive Plan is administered by the Compensation Committee and the Board of Directors of the Company. Under the terms of the 2017 Incentive Plan, the Company is authorized to grant a variety of incentive awards based on its common stock, including stock options (both incentive stock options and non-qualified stock options), RSUs, performance options/shares and other stock awards, as well as pay incentive bonuses to eligible employees and non-employee directors. On May 18, 2017, upon the approval of the 2017 Incentive Plan by shareholders, 5,000,000 shares were authorized for issuance thereunder, plus any shares subject to then-outstanding awards under the 2015 Incentive Plan and the 2013 Incentive Plan that subsequently were canceled, terminated unearned, expired, were forfeited, lapsed for any reason or were settled in cash without the delivery of shares. As of September 30, 2018,

3,408,995 shares remained for future issuance under the 2017 Incentive Plan. The 2017 Incentive Plan will terminate on April 3, 2027 unless it is extended or terminated earlier pursuant to its terms. In addition, from time to time, the Company makes inducement grants of stock options to new hires, which awards are made pursuant to the NASDAQ inducement grant exception. During the nine months ended September 30, 2018, the Company granted inducement stock options covering 236,730 shares of the Company's common stock to new employees.

On May 15, 2018, the 2018 Employee Stock Purchase Plan (2018 ESPP) was approved by shareholders at the Company's Annual Meeting of Shareholders. The Company has reserved the following for issuance under the 2018 ESPP: (i) 1,000,000 shares of common stock, plus (ii) commencing on January 1, 2019 and ending on December 31, 2023, an additional number of shares to be added on the first day of each calendar year equal to the lesser of (A) 1,200,000 shares of common stock, (B) 2% of the number of outstanding shares of common stock on such date and (C) an amount determined by the administrator.

Stock Options - The Company calculates the fair value of stock options granted using the Black-Scholes valuation model. The following table summarizes the Company's grant date fair value and assumptions used in determining the fair value of all stock options granted during the periods presented:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Volatility	66%-67%	72%-73%	66%-68%	72%-74%
Risk-free interest rate	2.75%-2.87%	1.73%-1.93%	2.25%-2.87%	1.73%-1.99%
Dividend yield	0.0%	0.0%	0.0%	0.0%
Expected option term (in years)	5.14	6.25	5.09	6.25
Weighted average fair value of stock options granted	$13.62	$9.59	$16.56	$10.18

For each period presented, the volatility factor was based on the Company's historical volatility during the expected option term. Estimated forfeitures are based on the actual percentage of option forfeitures since the closing of the Company's merger with Transave in December 2010. The expected option term for these grants was determined using the Company's historical exercise behavior of grantees.

From time to time, the Company has granted performance-condition options to certain of its employees. Vesting of these options was subject to the Company achieving certain performance criteria established at the date of grant and the grantees fulfilling a service condition (continued employment). During the quarter ended September 30, 2018, performance-condition options totaling $1.1 million, or 133,334 shares, met their recognition criteria as a result of the FDA approval of ARIKAYCE and vested in full. As of September 30, 2018, there were no performance-condition options outstanding.

The following table summarizes the Company's aggregate stock option activity for the nine months ended September 30, 2018:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life in Years	Aggregate Intrinsic Value (in thousands)
Options outstanding at December 31, 2017	8,608,921	$ 14.08		
Granted	1,610,010	$ 28.57		
Exercised	(427,729)	$ 14.94		
Forfeited or expired	(182,858)	$ 19.15		
Options outstanding at September 30, 2018	9,608,344	$ 16.37	7.08	$ 52,765
Vested and expected to vest at September 30, 2018	8,760,828	$ 15.90	6.92	$ 50,354
Exercisable at September 30, 2018	5,317,732	$ 13.23	5.96	$ 38,723

The total intrinsic value of stock options exercised during the three months ended September 30, 2018 and 2017 was $0.6 million and $1.4 million, respectively, and during the nine months ended September 30, 2018 and 2017 was $5.5 million and $3.5 million, respectively.

As of September 30, 2018, there was $34.7 million of unrecognized compensation expense related to unvested stock options, which is expected to be recognized over a weighted average period of 2.5 years. The following table summarizes the range of exercise prices and the number of stock options outstanding and exercisable as of September 30, 2018:

Outstanding as of September 30, 2018					Exercisable as of September 30, 2018	
Range of Exercise Prices ($)		Number of Options	Weighted Average Remaining Contractual Term (in years)	Weighted Average Exercise Price ($)	Number of Options	Weighted Average Exercise Price ($)
$ 3.03	$ 6.90	1,087,941	3.94	$ 3.99	1,087,941	$ 3.99
$ 6.96	$ 10.85	997,221	7.53	$ 10.77	481,574	$ 10.68
$ 11.14	$ 12.58	984,936	5.49	$ 12.17	893,989	$ 12.20
$ 12.66	$ 13.67	984,161	7.97	$ 13.60	428,577	$ 13.56
$ 13.94	$ 16.07	1,139,533	6.80	$ 15.26	765,384	$ 15.17
$ 16.09	$ 17.16	1,438,502	7.95	$ 16.69	602,949	$ 16.48
$ 17.24	$ 22.76	1,366,680	6.56	$ 21.20	1,017,263	$ 21.26
$ 22.84	$ 30.46	1,439,910	9.21	$ 28.61	40,055	$ 24.26
$ 30.86	$ 31.78	155,960	9.25	$ 31.10	—	$ —
$ 32.46	$ 32.46	13,500	9.26	$ 32.46	—	$ —

Restricted Stock and Restricted Stock Units — Under the 2017 Incentive Plan, the Company may grant restricted stock (RS) and RSUs to eligible participants, including its executives, non-employee directors, and other service providers. Each share of RS vests, and each RSU represents a right to receive one share of the Company's common stock, upon the completion of a specific period of continued service or achievement of a certain milestone. RS and RSU awards are valued at the market price of the Company's common stock on the date of grant. The Company recognizes noncash compensation expense for the fair values of these RS and RSU awards on a straight-line basis over the requisite service period of these awards. As of September 30, 2018, there was $4.2 million of unrecognized compensation expense related to unvested RSU awards which is expected to be recognized over a weighted average period of 2.8 years. The following table summarizes the Company's RSU award activity during the nine months ended September 30, 2018:

	Number of RSUs	Weighted Average Grant Price ($)
Outstanding at December 31, 2017	46,914	$ 17.16
Granted	248,468	$ 29.41
Released	(47,478)	$ 17.32
Forfeited	(3,103)	$ 30.46
Outstanding at September 30, 2018	244,801	$ 29.40

The following table summarizes the aggregate stock-based compensation expense recorded in the consolidated statements of comprehensive loss related to stock options and RSUs during the three and nine months ended September 30, 2018 and 2017, respectively:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(in millions)			
Research and development expenses	$ 2.8	$ 1.8	$ 7.4	$ 4.8
General and administrative expenses	5.1	2.9	12.8	8.5
Total	$ 7.9	$ 4.7	$ 20.2	$ 13.3

8. Income Taxes

The Company's provision for income taxes was $46,000 and $134,000 for the three and nine months ended September 30, 2018, respectively, and $27,000 and $94,000 for the three and nine months ended September 30, 2017, respectively. The provision for income taxes in all periods was a result of certain of the Company's subsidiaries in Europe, which had taxable income during the three and nine months ended September 30, 2018 and 2017. In jurisdictions where the Company has net losses, there was a full valuation allowance recorded against the Company's deferred tax assets and therefore no tax benefit was recorded.

Following adoption of the Tax Cuts and Jobs Act during the fourth quarter of 2017, the Company remeasured certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future, which is generally 21%. The Company recorded a provisional amount of $94.0 million as of December 31, 2017 related to the re-measurement of certain deferred tax balances, which was completely offset by a full valuation allowance. Upon further analyses, the Company determined in the second quarter of 2018 that the provisional amount would not need to be adjusted.

In addition to local taxes in foreign jurisdictions, the Company is subject to US federal, US state, and US tax on foreign earnings. In regard to the US tax on foreign earnings, the Company was subject to a one-time transition tax based on its total earnings and profits, which were generally deferred from US income taxes under previous US law. Due to the aggregate loss position of the Company's foreign subsidiaries, the Company did not record any provisional amount for the one-time transition tax liability at December 31, 2017. Additionally, the global intangible low-taxed income tax and base erosion provisions in the Tax Cuts and Jobs Act are effective for taxable years beginning after December 31, 2017. The Company does not currently expect these provisions to have a material impact (i) due to the aggregate loss position of its foreign subsidiaries and (ii) because the Company currently expects to be below the gross receipts threshold for purposes of the base erosion provisions.

The Company is subject to US federal and state income taxes and the statute of limitations for tax audit is open for the Company's federal tax returns for the years ended 2014 and later, and is generally open for certain states for the years 2013 and later. The Company has incurred net operating losses since inception, except for the year ended December 31, 2009. Such loss carryforwards would be subject to audit in any tax year in which those losses are utilized, notwithstanding the year of origin. As of September 30, 2018 and December 31, 2017, the Company had recorded no reserves for unrecognized income tax benefits, nor had it recorded any accrued interest or penalties related to uncertain tax positions. The Company does not anticipate any material changes in the amount of unrecognized tax positions over the next 12 months.

9. Commitments and Contingencies

The Company has an operating lease for office and laboratory space located in Bridgewater, NJ, its corporate headquarters, for which the initial lease term expires in November 2019. Future minimum rental payments under this lease are $1.2 million. In July 2016, the Company signed an operating lease for laboratory space located in Bridgewater, NJ for which the initial lease term expires in December 2021. Future minimum rental payments under this lease are $1.5 million.

In September 2018, the Company entered into a lease agreement for office space in Bridgewater, NJ for its future corporate headquarters. The lease provides for a commencement date of the earlier of (1) September 1, 2019, subject to completion of certain improvements by specified dates, and (2) the date on which the Company takes possession of the premises to commence its business operations therein (the Commencement Date). The initial lease term runs 130 months from the Commencement Date (plus any partial month from the Commencement Date until the first day of the next full calendar month during the term), and the Company has the option to extend that term for up to three additional five-year periods. Future minimum rental payments under this lease are $32.3 million.

Rent expense charged to operations was $0.4 million and $0.4 million for the three months ended September 30, 2018 and 2017, respectively, and $1.2 million and $1.1 million for the nine months ended September 30, 2018 and 2017, respectively. Future minimum rental payments required under the Company's leases for the period from October 1, 2018 to December 31, 2018 and for each of the five years thereafter are as follows (in thousands):

Year Ending December 31:		
2018 (remaining)	$	490
2019		3,863
2020		4,185
2021		3,958
2022		1,281
2023 and thereafter		23,261
	$	37,038

Legal Proceedings

From time to time, the Company is a party to various lawsuits, claims and other legal proceedings that arise in the ordinary course of business. While the outcomes of these matters are uncertain, management does not expect that the ultimate costs to resolve these matters will have a material adverse effect on the Company's consolidated financial position, results of operations or cash flows.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Cautionary Note Regarding Forward Looking Statements

This Quarterly Report on Form 10-Q contains forward-looking statements that involve substantial risks and uncertainties. "Forward-looking statements," as that term is defined in the Private Securities Litigation Reform Act of 1995, are statements that are not historical facts and involve a number of risks and uncertainties. Words herein such as "may," "will," "should," "could," "would," "expects," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "intends," "potential," "continues," and similar expressions (as well as other words or expressions referencing future events, conditions or circumstances) identify forward-looking statements.

Forward-looking statements are based on our current expectations and beliefs, and involve known and unknown risks, uncertainties and other factors, which may cause our actual results, performance and achievements and the timing of certain events to differ materially from the results, performance, achievements or timing discussed, projected, anticipated or indicated in any forward-looking statements. Such risks, uncertainties and other factors include, among others, the following:

- *failure to successfully commercialize or maintain US approval for ARIKAYCE, our only approved product;*
- *uncertainties in the degree of market acceptance of ARIKAYCE by physicians, patients, third-party payers and others in the health-care community;*
- *our inability to obtain full approval of ARIKAYCE from the US Food and Drug Administration (FDA), including the risk that we will not successfully complete the confirmatory post-marketing study required for full approval;*
- *inability of us, PARI Pharma GmbH (PARI) or our third party manufacturers to comply with regulatory requirements related to ARIKAYCE or the Lamira Nebulizer System;*
- *our inability to obtain adequate reimbursement from government or third-party payers for ARIKAYCE or acceptable prices for ARIKAYCE;*
- *development of unexpected safety or efficacy concerns related to ARIKAYCE;*
- *inaccuracies in our estimates of the size of the potential markets for ARIKAYCE;*
- *our inability to create an effective direct sales and marketing infrastructure or to partner with third parties that offer such an infrastructure for distribution of ARIKAYCE;*
- *failure to obtain regulatory approval to expand ARIKAYCE's indication to a broader patient population;*
- *failure to successfully conduct future clinical trials for ARIKAYCE and our product candidates, including due to our limited experience in conducting preclinical development activities and clinical trials necessary for regulatory approval and our inability to enroll or retain sufficient patients to complete the trials or generate data necessary for regulatory approval;*
- *risks that our clinical studies will be delayed or that serious side effects will be identified during drug development;*
- *failure to obtain regulatory approvals for ARIKAYCE outside the US or for our product candidates in the US, Europe, Japan or other markets;*

- *failure of third parties on which we are dependent to manufacture sufficient quantities of ARIKAYCE or our product candidates for commercial or clinical needs, to conduct our clinical trials, or to comply with our agreements or laws and regulations that impact our business;*
- *our inability to attract and retain key personnel or to effectively manage our growth;*
- *our inability to adapt to our highly competitive and changing environment;*
- *our inability to adequately protect our intellectual property rights or prevent disclosure of our trade secrets and other proprietary information and costs associated with litigation or other proceedings related to such matters;*
- *restrictions imposed on us by material license agreements, including our license agreements with PARI and AstraZeneca AB (AstraZeneca), and failure to comply with our obligations under such agreements;*
- *the cost and potential reputational damage resulting from litigation to which we are or may become a party, including product liability claims;*
- *limited experience operating internationally;*
- *changes in laws and regulations applicable to our business and failure to comply with such laws and regulations; and*
- *inability to repay our existing indebtedness and uncertainties with respect to our ability to access future capital.*

We caution readers not to place undue reliance on any such forward-looking statements, which speak only as of the date they are made. Any forward-looking statement is based on information current as of the date of this Quarterly Report on Form 10-Q and speaks only as of the date on which such statement is made. Actual events or results may differ materially from the results, plans, intentions or expectations anticipated in these forward-looking statements as a result of a variety of factors, many of which are beyond our control. More information on factors that could cause actual results to differ materially from those anticipated is included from time to time in our reports filed with the Securities and Exchange Commission (SEC), including, but not limited to, those described in the sections titled "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in this Quarterly Report on Form 10-Q and our Annual Report on Form 10-K for the fiscal year ended December 31, 2017. We disclaim any obligation, except as specifically required by law, and the rules of the SEC, to publicly update or revise any such statements to reflect any change in our expectations or in events, conditions or circumstances on which any such statements may be based, or that may affect the likelihood that actual results will differ from those set forth in the forward-looking statements.

The following discussion should be read in conjunction with our consolidated financial statements and related notes thereto included elsewhere in this Quarterly Report on Form 10-Q and the consolidated financial statements and related notes thereto in our Annual Report on Form 10-K for the year ended December 31, 2017.

OVERVIEW

We are a global biopharmaceutical company on a mission to transform the lives of patients with serious and rare diseases. Our first commercial product, ARIKAYCE (amikacin liposome inhalation suspension), received accelerated approval in the United States (US) on September 28, 2018 for the treatment of *Mycobacterium avium* complex (MAC) lung disease as part of a combination antibacterial drug regimen for adult patients with limited or no alternative treatment options. MAC lung disease is a rare and often chronic infection that can cause irreversible lung damage and can be fatal. Our clinical-stage pipeline includes INS1007 and INS1009. INS1007 is a novel oral, reversible inhibitor of dipeptidyl peptidase 1 (DPP1) with therapeutic potential in non-cystic fibrosis (non-CF) bronchiectasis and other inflammatory diseases. INS1009 is an inhaled formulation of a treprostinil prodrug that may offer a differentiated product profile for rare pulmonary disorders, including pulmonary arterial hypertension (PAH).

The table below summarizes the current status and anticipated milestones for ARIKAYCE and our product candidates INS1007 and INS1009.

Principal Product/Product Candidate	Status	Next Expected Milestones
ARIKAYCE for MAC lung disease	•We are focused on having a successful commercial launch of ARIKAYCE in the US for appropriate patients. We began commercial shipments of ARIKAYCE in October 2018. • In September 2018, the FDA granted accelerated approval of ARIKAYCE for the treatment of MAC lung disease as part of a combination antibacterial drug regimen for adult patients who have limited or no alternative treatment options. • We announced interim data from the CONVERT study and the 312 extension study in January 2018, which we view as consistent with the six-month results of the CONVERT study. The data included interim long-term durability data for the CONVERT study and interim efficacy data for the 312 study. These studies are ongoing. • We announced top-line data for the CONVERT study in September 2017. The CONVERT study met its primary endpoint of culture conversion, which we defined as three consecutive negative monthly sputum cultures by month six with statistical and clinical significance, with 29% of patients in the ARIKAYCE plus current guideline-based therapy (GBT) arm achieving culture conversion, compared to 9% of patients in the GBT-only arm ($p<0.0001$). • The FDA has designated ARIKAYCE as an orphan drug and a qualified infectious disease product (QIDP) for nontuberculous mycobacterial (NTM) lung disease, and the European Commission has granted an orphan designation for ARIKAYCE for the treatment of NTM lung disease.	• We intend to seek regulatory approvals for ARIKAYCE outside the US, such as in Europe and Japan, when sufficient data are available. If approved, we expect ARIKAYCE would be the first inhaled therapy specifically indicated for the treatment of MAC lung disease in Europe and Japan • We intend to collaborate with the FDA on, and invest in, the post-approval confirmatory clinical trial required by the FDA to support full approval and lifecycle management programs. • If approved, we plan to commercialize ARIKAYCE in certain countries in Europe, Japan, and certain other countries.
INS1007 (oral reversible inhibitor of DPP1) for non-CF bronchiectasis and other rare diseases	• We are enrolling patients in the WILLOW study, a global phase 2, randomized, double-blind, placebo-controlled, parallel-group, multi-center clinical study to assess the efficacy, safety and tolerability, and pharmacokinetics of INS1007 administered once daily for 24 weeks in subjects with non-CF bronchiectasis. • We are currently assessing regulatory strategies which could expedite the development and regulatory reviews of INS1007 in the US and the European Union (EU).	• We expect to continue to advance enrollment in the WILLOW clinical study of INS1007 during 2018. • We are exploring the potential of INS1007 in various neutrophil-driven inflammatory conditions.
INS1009 (inhaled formulation of a treprostinil prodrug) for rare pulmonary disorders	• The results of our phase 1 study of INS1009 were presented at the European Respiratory Society international congress in September 2016.	• We believe INS1009 may offer a differentiated product profile for rare pulmonary disorders, including PAH, and we are currently evaluating our options to advance its development including exploring its use as an inhaled dry powder formulation.

Our earlier-stage pipeline includes preclinical compounds that we are evaluating in multiple rare diseases of unmet medical need, including gram positive pulmonary infections and NTM lung disease. To complement our internal research and development, we actively evaluate in-licensing and acquisition opportunities for a broad range of rare diseases.

Our Strategy

Our strategy focuses on the needs of patients with rare diseases. We are currently primarily focused on the US commercial launch of ARIKAYCE. We are not aware of any other approved inhaled therapies specifically indicated to treat MAC lung disease in North America, Europe, or Japan. We secured US regulatory approval of ARIKAYCE for the treatment of MAC lung disease in patients with limited or no alternative treatment options. We also believe that ARIKAYCE has the potential to treat a number of different bacterial infections. We are also advancing earlier-stage programs in other rare pulmonary disorders.

Our current priorities are as follows:

- Launching ARIKAYCE in the US for appropriate patients;
- Establishing patient access and providing appropriate support for patients being prescribed ARIKAYCE;
- Ensuring our product supply chain will support the commercialization and potential future lifecycle management programs of ARIKAYCE;
- Designing and conducting the required confirmatory clinical trial to support full US approval of ARIKAYCE;
- Developing the core value dossier to support the reimbursement for ARIKAYCE in the US, Europe and Japan;
- Obtaining determinations of coverage and reimbursement in the US for ARIKAYCE from governmental and other third-party payers;
- Supporting further research and lifecycle management strategies for ARIKAYCE, including exploring the potential use of ARIKAYCE as part of a front-line, multi-drug regimen and as maintenance monotherapy to prevent recurrence (defined as true relapse or reinfection) of MAC lung disease;
- Continuing expansion efforts in certain countries in Europe and Japan to prepare for regulatory filings for ARIKAYCE;
- Enrolling patients in the WILLOW phase 2 study of INS1007 in non-CF bronchiectasis;
- Exploring INS1009 for use as an inhaled dry powder formulation and generating preclinical findings from our earlier-stage programs; and
- Expanding our rare disease pipeline through corporate development.

ARIKAYCE for Patients with MAC Lung Disease

ARIKAYCE (amikacin liposome inhalation suspension) is our first approved product. ARIKAYCE received accelerated approval in the US on September 28, 2018 for the treatment of MAC lung disease as part of a combination antibacterial drug regimen for adult patients with limited or no alternative treatment options. MAC lung disease is a rare and often chronic infection that can cause irreversible lung damage and can be fatal. Amikacin solution for parenteral administration is an established drug that has activity against a variety of NTM; however, its use is limited by the need to administer it intravenously and by toxicity to hearing, balance, and kidney function (Peloquin et al., 2004). Unlike amikacin solution for intravenous administration, our advanced liposome technology uses charge-neutral liposomes to deliver amikacin directly to the lungs where it is taken up by the lung macrophages where the MAC infection resides. This technology prolongs the release of amikacin in the lungs, while minimizing systemic exposure, thereby offering the potential for decreased systemic toxicities. ARIKAYCE's ability to deliver high levels of amikacin directly to the lung distinguishes it from intravenous amikacin. ARIKAYCE is administered once-daily, using the Lamira Nebulizer System, an inhalation device developed and manufactured by PARI. Lamira is a portable nebulizer that enables aerosolization of liquid medications, including liposomal formulations such as ARIKAYCE, via a vibrating, perforated membrane.

The FDA has designated ARIKAYCE as an orphan drug and a QIDP for NTM lung disease. Orphan designated drugs are eligible for seven years of exclusivity for the orphan indication. QIDP designation features an additional five years of exclusivity for the designated indication. The FDA granted a total of 12 years exclusivity in the indication for which ARIKAYCE was approved.

Accelerated Approval

In March 2018, we submitted a new drug application for ARIKAYCE to the FDA pursuant to Section 506(c) of the Federal Food Drug and Cosmetic Act and 21 C.F.R. Part 314 Subpart H (Accelerated Approval of New Drugs for Serious or Life-Threatening Illnesses) (Subpart H). Accelerated approval under Subpart H allows drugs that (i) are being developed to treat a serious or life-threatening disease or condition and (ii) provide a meaningful therapeutic benefit over existing treatments to be approved substantially based on an intermediate endpoint or a surrogate endpoint that is reasonably likely to predict clinical benefit, rather than a clinical endpoint such as survival or irreversible morbidity. The FDA granted our request for a priority review and set a PDUFA action date of September 28, 2018. On August 7, 2018, the FDA advisory committee voted 12-2 in favor of the safety and effectiveness of ARIKAYCE for adults with MAC lung disease who have limited or no treatment options. The committee also voted in favor of the surrogate endpoint of sputum culture conversion used in the Phase 3 CONVERT study being reasonably likely to predict clinical benefit. In a separate vote, the committee voted against the safety and effectiveness of ARIKAYCE in the broadest population of adult patients with MAC lung disease. On September 28, 2018, the FDA granted approval for ARIKAYCE under the Limited Population Pathway for Antibacterial and Antifungal Drugs (LPAD) for the treatment of MAC lung disease as part of a combination antibacterial drug regimen for adult patients with limited or no alternative treatment options and the accelerated approval pathway. LPAD, which was enacted as part of the 21st Century Cures Act, serves to advance the development of new antibacterial drugs to treat serious or life-threatening infections in limited populations of patients with unmet needs. As required for drugs approved under the LPAD pathway, labeling for ARIKAYCE includes certain statements to convey that the drug has been shown to be safe and effective only for use in a limited population. Approval under the LPAD pathway may be supported by a streamlined clinical development program.

As a condition of accelerated approval, we must conduct a post-approval confirmatory clinical trial. The required confirmatory trial, which is currently under discussion with FDA, is proposed to be a randomized, double-blind, placebo-controlled clinical trial to assess and describe the clinical benefit of ARIKAYCE in patients with MAC lung disease. The trial will evaluate the effect of ARIKAYCE on a clinically meaningful endpoint, as compared to an appropriate control, in the intended patient population of patients with MAC lung disease. Pursuant to the timetable agreed upon with the FDA, the study protocol is scheduled to be finalized in 2019, with trial results to be reported by 2024. Continued approval of ARIKAYCE will be contingent upon verification and description of clinical benefit in this study.

Further Research and Lifecycle Management for ARIKAYCE

Along with the post-approval confirmatory clinical study described above, we are currently exploring and supporting research and lifecycle management programs for ARIKAYCE beyond treatment of MAC lung disease as part of a combination antibacterial regimen for adult patients who have limited or no treatment options. Specifically, we are evaluating future study designs focusing on the MAC lung disease treatment pathway, including front-line treatment and monotherapy maintenance to prevent recurrence (defined as true relapse or reinfection) of MAC lung disease.

If the data from the CONVERT study are sufficient to support our marketing authorization applications (MAAs) in Europe and Japan and those regulatory bodies approve ARIKAYCE, lifecycle management studies could potentially enable us to reach more patients worldwide. In addition, we are evaluating the use of ARIKAYCE to treat infections caused by non-MAC NTM species, such as *M. abscessus*. These initiatives include investigator-initiated studies, which are clinical studies initiated and sponsored by physicians or research institutions with funding from us, and may also include new clinical studies sponsored by us.

Market Opportunity for ARIKAYCE in MAC Lung Disease in 2018

NTM lung disease is associated with increased rates of morbidity and mortality, and MAC is the predominant pathogenic species in NTM lung disease in the US, Europe and Japan. The prevalence of NTM lung disease has increased over the past two decades, and we believe it is an emerging public health concern worldwide. Based on currently available information from external sources, including market research funded by us and third parties, and internal analyses and calculations, we estimate potential patient populations in the US, Japan and the EU5 (comprised of France, Germany, Italy, Spain and the United Kingdom) for 2018 as follows:

Potential Market	Estimated Number of Patients with Diagnosed NTM Lung Disease	Estimated Number of Patients Treated for MAC Lung Disease	Estimated Number of MAC lung disease Patients Refractory to Treatment**
United States	75,000-105,000	40,000-50,000	10,000-15,000
Japan	125,000-145,000	60,000-70,000	15,000-18,000
EU5	14,000	4,400	1,400

*** ARIKAYCE received accelerated approval for this population in the US in September 2018.*

We are not aware of any other approved inhaled therapies specifically indicated for NTM lung disease in North America, Europe or Japan. Current guideline-based approaches for NTM lung disease, including those from the American Thoracic Society and Infectious Diseases Society of America, involve multi-drug regimens not approved for the treatment of NTM lung disease and treatment that could last two years or more. Based on a burden of illness study that we conducted in the US with a major medical benefits provider, we previously concluded that patients with NTM lung disease are costly to healthcare plans, while a recent claims-based study in the US has shown that patients with NTM lung disease have higher resource utilization and costs than their age and gender-matched controls. Accordingly, we believe that a significant market opportunity for ARIKAYCE in NTM lung disease exists in the US and internationally.

We are currently exploring the MAC lung disease market opportunity for ARIKAYCE in Japan. The CONVERT study included a comprehensive pharmacokinetic sub-study in Japanese subjects in lieu of a separate local pharmacokinetic study in Japan, as agreed with the PDMA. If the data from the CONVERT study are sufficient to support our MAAs, we expect to submit regulatory filings in Europe and Japan. We established a Japanese subsidiary and, in 2018, began hiring local employees, including a general manager, to closely manage our regulatory and pre-commercial activities.

Product Pipeline

INS1007

INS1007 is a small molecule, oral, reversible inhibitor of DPP1, which we licensed from AstraZeneca in October 2016. DPP1 is an enzyme responsible for activating neutrophil serine proteases in neutrophils when they are formed in the bone marrow. Neutrophils are the most common type of white blood cell and play an essential role in pathogen destruction and inflammatory mediation. Neutrophils contain the neutrophil serine proteases (including neutrophil elastase, proteinase 3, and cathepsin G) that have been implicated in a variety of inflammatory diseases. In chronic inflammatory lung diseases, neutrophils accumulate in the airways and release active neutrophil serine proteases in excess that cause lung destruction and inflammation. INS1007 may decrease the damaging effects of inflammatory diseases, such as non-CF bronchiectasis, by inhibiting DPP1 and its activation of neutrophil serine proteases. Non-CF bronchiectasis is a progressive pulmonary disorder in which the bronchi become permanently dilated due to chronic inflammation and infection. Currently, there is no cure, and we are not aware of any FDA-approved therapies specifically indicated for non-CF bronchiectasis.

The WILLOW Study

The WILLOW study is a global phase 2, randomized, double-blind, placebo-controlled, parallel group, multi-center clinical study to assess the efficacy, safety and tolerability, and pharmacokinetics of INS1007 administered once daily for 24 weeks in subjects with non-CF bronchiectasis. We commenced enrollment in the WILLOW study in December 2017. In addition, we are exploring the potential of INS1007 in various neutrophil-driven inflammatory conditions.

INS1009

INS1009 is an investigational sustained-release inhaled treprostinil prodrug formulation that has the potential to address certain of the current limitations of existing prostanoid therapies. We believe that INS1009 prolongs duration of effect and may provide PAH patients with greater consistency in pulmonary arterial pressure reduction over time. Current inhaled prostanoid therapies must be dosed four to nine times per day for the treatment of PAH. Reducing dose frequency has the potential to ease patient burden and improve compliance. Additionally, we believe that INS1009 may be associated with fewer side effects, including elevated heart rate, low blood pressure, and severity and/or frequency of cough, associated with high initial drug levels and local upper airway exposure when using current inhaled prostanoid therapies. We believe INS1009 may offer a differentiated product profile for rare pulmonary disorders, including PAH, and we are currently evaluating our options to advance its development, including exploring its use as an inhaled dry powder formulation.

KEY COMPONENTS OF OUR STATEMENT OF OPERATIONS

Research and Development (R&D) Expenses

R&D expenses consist of salaries, benefits and other related costs, including stock-based compensation, for personnel serving in our research and development functions, including medical affairs. Expenses also include other internal operating expenses, the cost of manufacturing ARIKAYCE and our product candidates for clinical study, the cost of conducting clinical studies, and the cost of conducting preclinical and research activities. In addition, our R&D expenses include payments to third parties for the license rights to products or components thereof in development prior to regulatory approval, such as the Lamira Nebulizer System and INS1007. Our expenses related to manufacturing ARIKAYCE and our product candidates for clinical studies and commercial inventory, if any, prior to regulatory approvals are primarily related to activities at contract manufacturing organizations (CMOs) that manufacture ARIKAYCE and our product candidates for our use, including purchases of active pharmaceutical ingredients. R&D expenses also include spending to build-out the CMO facilities to support commercialization of ARIKAYCE in the US and potential future global production requirements. Our expenses related to clinical trials are primarily related to activities at CROs that conduct and manage clinical trials on our behalf.

Since 2011, we have focused our development activities principally on our proprietary, advanced liposomal technology designed specifically for inhaled therapies. Our development efforts since 2015 have principally related to the development of ARIKAYCE in NTM lung disease.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries, benefits and other related costs, including stock-based compensation, for our non-employee directors and personnel serving in our executive, finance and accounting, legal and compliance, pre-commercial, corporate development, information technology, program management and human resource functions. General and administrative expenses also include professional fees for legal services and patent-related expenses, consulting services including for pre-commercial planning activities such as non-branded disease awareness, insurance, board of director fees, tax and accounting services.

Investment Income and Interest Expense

Investment income consists of interest income earned on our cash and cash equivalents. Interest expense consists primarily of contractual interest expense, amortization of debt issuance costs and accretion of debt discount. Debt issuance costs are amortized, and the debt discount is accreted to interest expense using the effective interest rate method over the term of the debt. Unamortized debt issuance costs associated with extinguished debt are expensed in the period of the extinguishment.

RESULTS OF OPERATIONS

Comparison of the Three Months Ended September 30, 2018 and 2017

Net Loss

Net loss for the quarter ended September 30, 2018 was $87.7 million, or $1.14 per share—basic and diluted, compared with a net loss of $45.2 million, or $0.69 per share—basic and diluted, for the quarter ended September 30, 2017. The $42.6 million increase in our net loss for the quarter ended September 30, 2018 as compared to the same period in 2017 was primarily due to:

- Increased R&D expenses of $12.9 million, primarily resulting from an increase in external manufacturing expenses and higher compensation and related expenses due to an increase in headcount; and
- Increased general and administrative expenses of $27.0 million, resulting from higher compensation and related expenses due to an increase in headcount, and an increase in consulting fees relating to pre-commercial planning activities in preparation for the launch of ARIKAYCE.

In addition, there was a $5.2 million increase in interest expense resulting from the issuance of $450.0 million aggregate principal amount of 1.75% convertible senior notes due 2025 (the Convertible Notes) in January 2018.

R&D Expenses

R&D expenses for the quarters ended September 30, 2018 and 2017 were comprised of the following components (in thousands):

	Quarters Ended September 30,		Increase (decrease)	
	2018	2017	$	%
External Expenses				
Clinical development & research	$ 8,047	$ 12,307	$ (4,260)	(34.6)%
Manufacturing	13,130	2,884	10,246	355.3 %
Regulatory and quality assurance	2,969	1,370	1,599	116.7 %
Subtotal—external expenses	$ 24,146	$ 16,561	$ 7,585	45.8 %
Internal Expenses				
Compensation and related expenses	$ 12,863	$ 8,373	$ 4,490	53.6 %
Other internal operating expenses	2,529	1,741	788	45.3 %
Subtotal—internal expenses	$ 15,392	$ 10,114	$ 5,278	52.2 %
Total	$ 39,538	$ 26,675	$ 12,863	48.2 %

R&D expenses increased to $39.5 million during the quarter ended September 30, 2018 from $26.7 million in the same period in 2017. The $12.9 million increase was primarily due to an increase of $10.2 million in external manufacturing expenses, specifically related to purchases of ARIKAYCE raw materials, CMO expenses related to ARIKAYCE commercial inventory production, and construction costs relating to the build-out of a third party CMO production facility. In addition, there was a $4.5 million increase in compensation and related expenses due to an increase in headcount in the quarter ended September 30, 2018 as compared to the prior year period.

General and Administrative Expenses

General and administrative expenses for the quarters ended September 30, 2018 and 2017 were comprised of the following (in thousands):

	Quarters Ended September 30,		Increase (decrease)	
	2018	2017	$	%
General & administrative	$ 17,290	$ 9,355	$ 7,935	84.8%
Pre-commercial expenses	27,155	8,053	19,102	237.2%
Total general & administrative expenses	$ 44,445	$ 17,408	$ 27,037	155.3%

General and administrative expenses increased to $44.4 million during the quarter ended September 30, 2018 from $17.4 million in the same period in 2017. The $27.0 million increase was primarily due to $11.7 million in higher compensation and related expenses due to an increase in headcount, including the hiring of our field force, and $13.2 million in consulting fees relating to pre-commercial planning activities in preparation for the launch of ARIKAYCE, including non-branded disease awareness, patient support planning, field operations and other professional fees.

Interest Expense

Interest expense was $6.7 million for the quarter ended September 30, 2018 as compared to $1.5 million in the same period in 2017. The $5.2 million increase in interest expense in the quarter ended September 30, 2018 as compared to the prior year period relates to the issuance of $450.0 million aggregate principal amount of the Convertible Notes in January 2018. The interest expense on the Convertible Notes is based on an effective interest rate of 7.6%.

Comparison of the Nine Months Ended September 30, 2018 and 2017

Net Loss

Net loss for the nine months ended September 30, 2018 was $232.7 million, or $3.03 per share—basic and diluted, compared with a net loss of $127.3 million, or $2.01 per share—basic and diluted, for the nine months ended September 30,

2017. The $105.4 million increase in our net loss for the quarter ended September 30, 2018 as compared to the same period in 2017 was primarily due to:

- Increased R&D expenses of $29.6 million, primarily resulting from an increase in external manufacturing expenses and higher compensation and related expenses due to an increase in headcount; and
- Increased general and administrative expenses of $66.5 million, resulting from higher compensation and related expenses due to an increase in headcount, and an increase in consulting fees relating to pre-commercial planning activities in the preparation for the launch of ARIKAYCE.

In addition, there was a $14.3 million increase in interest expense resulting from the issuance of $450.0 million aggregate principal amount of the Convertible Notes in January 2018.

R&D Expenses

R&D expenses for the nine months ended September 30, 2018 and 2017 were comprised of the following components (in thousands):

	Nine Months Ended September 30,		Increase (decrease)	
	2018	2017	$	%
External Expenses				
Clinical development & research	$ 22,785	$ 30,627	$ (7,842)	(25.6)%
Manufacturing	32,010	10,490	21,520	205.1 %
Regulatory and quality assurance	8,128	4,863	3,265	67.1 %
Subtotal—external expenses	$ 62,923	$ 45,980	$ 16,943	36.8 %
Internal Expenses				
Compensation and related expenses	$ 34,339	$ 24,071	$ 10,268	42.7 %
Other internal operating expenses	8,096	5,749	2,347	40.8 %
Subtotal—internal expenses	$ 42,435	$ 29,820	$ 12,615	42.3 %
Total	$ 105,358	$ 75,800	$ 29,558	39.0 %

R&D expenses increased to $105.4 million during the nine months ended September 30, 2018 from $75.8 million in the same period in 2017. The $29.6 million increase was primarily due to an increase of $21.5 million in external manufacturing expenses, specifically related to purchases of ARIKAYCE raw materials, CMO expenses related to ARIKAYCE commercial inventory production, and construction costs relating to the build-out of a third party CMO production facility. In addition, there was a $10.3 million increase in compensation and related expenses due to an increase in headcount in the nine months ended September 30, 2018 as compared to the prior year period.

General and Administrative Expenses

General and administrative expenses for the nine months ended September 30, 2018 and 2017 were comprised of the following (in thousands):

	Nine Months Ended September 30,		Increase (decrease)	
	2018	2017	$	%
General & administrative	$ 44,264	$ 27,364	$ 16,900	61.8%
Pre-commercial expenses	69,994	20,403	49,591	243.1%
Total general & administrative expenses	$ 114,258	$ 47,767	$ 66,491	139.2%

General and administrative expenses increased to $114.3 million during the nine months ended September 30, 2018 from $47.8 million in the same period in 2017. The $66.5 million increase was primarily due to $31.1 million in higher compensation and related expenses due to an increase in headcount, including the hiring of our field force, and $28.2 million in consulting fees relating to pre-commercial planning activities in preparation for the launch of ARIKAYCE, including non-branded disease awareness, patient support planning, field operations and other professional fees. In addition, there was an

increase of $4.3 million related to patient services software licenses and fees, and ongoing training costs for the field force hired in the first quarter of 2018.

Interest Expense

Interest expense was $18.8 million for the nine months ended September 30, 2018 as compared to $4.5 million in the same period in 2017. The $14.3 million increase in interest expense in the nine months ended September 30, 2018 as compared to the prior year period relates to the issuance of $450.0 million aggregate principal amount of Convertible Notes in January 2018. The interest expense on the Convertible Notes is based on an effective interest rate of 7.6%.

LIQUIDITY AND CAPITAL RESOURCES

Overview

There is considerable time and cost associated with developing a potential pharmaceutical product to the point of regulatory approval and commercialization. To date, we have not generated material revenue from ARIKAYCE. We commenced commercial shipments of ARIKAYCE in October 2018, but we do not expect to generate material revenue in 2018. In recent years, we have funded our operations through public offerings of equity securities and debt financings. We expect to continue to incur operating losses both in our US and certain international entities, as we plan to fund research and development activities and commercial launch activities for ARIKAYCE.

In January 2018, we completed an underwritten public offering of $450.0 million aggregate principal amount of Convertible Notes, including the exercise in full of the underwriter's option to purchase additional Convertible Notes. Our net proceeds from the offering, after deducting underwriting discounts and commissions and other offering expenses of $14.2 million, were $435.8 million.

In September 2017, we completed an underwritten public offering of 14,123,150 shares of our common stock, which included the underwriter's exercise in full of its over-allotment option of 1,842,150 shares, at a price to the public of $28.50 per share. Our net proceeds from the sale of the shares, after deducting underwriting discounts and offering expenses of $24.8 million, were $377.7 million.

We may need to raise additional capital to fund our operations, including commercialization of ARIKAYCE and future clinical trials related to ARIKAYCE, to develop INS1007 and INS1009, and to develop, acquire, in-license or co-promote other products that address orphan or rare diseases. We believe we currently have sufficient funds to meet our financial needs for at least the next 12 months. We may opportunistically raise additional capital and may do so through equity or debt financing(s), strategic transactions or otherwise. We expect such additional funding, if any, would be used to continue to commercialize ARIKAYCE, to conduct further trials of ARIKAYCE, develop our product candidates, or to pursue the license or purchase of other technologies or products. During the remainder of 2018, we plan to support the commercial launch of ARIKAYCE in the US, to continue to fund further clinical development of ARIKAYCE and INS1007, and support efforts to obtain regulatory approvals for ARIKAYCE outside the US. Our cash requirements for the remainder of 2018 and for 2019 will be impacted by a number of factors, the most significant of which are expenses related to the commercialization efforts for ARIKAYCE, the CONVERT and 312 studies, and to a lesser extent, expenses related to INS1007 and future ARIKAYCE clinical trials.

Cash Flows

As of September 30, 2018, we had cash and cash equivalents of $567.6 million, as compared with $381.2 million as of December 31, 2017. The $186.4 million increase was due primarily to the net cash proceeds from our issuance of Convertible Notes in January 2018, partially offset by cash used in operating activities and, to a lesser extent, cash used in investing activities. Our working capital was $520.1 million as of September 30, 2018 as compared with $344.8 million as of December 31, 2017.

Net cash used in operating activities was $188.4 million and $111.4 million for the nine months ended September 30, 2018 and 2017, respectively. The net cash used in operating activities during the nine months ended September 30, 2018 and 2017 was primarily for the pre-commercial, clinical and manufacturing activities related to ARIKAYCE, as well as general and administrative expenses. In addition, net cash used in operating activities during the nine months ended September 30, 2018 included clinical trial expenses related to INS1007.

Net cash used in investing activities was $10.1 million and $1.3 million for the nine months ended September 30, 2018 and 2017, respectively. The net cash used in investing activities in 2018 was primarily related to the purchase of fixed assets for our long-term production capacity build-out at one of our CMOs. The net cash used in investing activities in 2017 related to payments for the build-out of our lab facility in Bridgewater, New Jersey.

Net cash provided by financing activities was $384.9 million and $380.7 million for the nine months ended September 30, 2018 and 2017, respectively. Net cash provided by financing activities for the nine months ended September 30, 2018 included net cash proceeds of $435.8 million from our issuance of Convertible Notes in January 2018 and cash proceeds from stock option exercises, partially offset by the February 2018 pay-off of our outstanding debt to Hercules Capital (Hercules) in the amount of $55.0 million. Net cash provided by financing activities for the nine months ended September 30, 2017 was primarily due to the issuance of 14.1 million shares of our common stock in September 2017, along with cash proceeds from stock option exercises.

Contractual Obligations

There were no material changes outside of the ordinary course of business in our contractual obligations during the nine months ended September 30, 2018 from those disclosed in Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources—Contractual Obligations" in our Annual Report on Form 10-K for the year ended December 31, 2017, except for the following:

In January 2018, we completed an underwritten public offering of $450.0 million aggregate principal amount of Convertible Notes pursuant to an indenture between the Company and Wells Fargo Bank, National Association, as trustee. Our net proceeds from the offering, after deducting underwriting discounts and commissions and other offering expenses of $14.2 million, were approximately $435.8 million. The Convertible Notes bear interest payable semiannually in arrears on January 15 and July 15 of each year, beginning on July 15, 2018. The Convertible Notes mature on January 15, 2025, unless earlier converted, redeemed, or repurchased. The Convertible Notes are convertible into common stock of the Company under certain circumstances described in the indenture. See *Note 5 - Debt* of our consolidated financial statements for more information.

In February 2018, we used part of the net proceeds from the issuance of the Convertible Notes to pay off the outstanding debt owed to Hercules. The payments consisted of $55.0 million for the principal amount and an additional $3.2 million in back-end fees, outstanding interest, and prepayment penalties. As a result, we incurred a $2.2 million loss on the extinguishment of debt in the quarter ended March 31, 2018.

In September 2018, we entered into an agreement (the Lease) with Exeter 700 Route 202/206, LLC to lease approximately 117,000 rentable square feet of office space located at 700 Route 202/206, Bridgewater, New Jersey for our future headquarters. Subject to certain conditions, we have the one-time option to expand the leased premises by up to 50,000 rentable square feet, exercisable prior to the fifth anniversary of the Commencement Date (as defined below). The Lease provides for a commencement date of the earlier of (1) September 1, 2019, subject to completion of certain improvements by specified dates, and (2) the date on which we take possession of the premises to commence its business operations therein (the Commencement Date). The initial Lease term runs 130 months from the Commencement Date (plus any partial month from the Commencement Date until the first day of the next full calendar month during the term) and we have the option to extend that term for up to three additional five-year periods. In addition, we are also responsible for operating expenses and taxes pursuant to the Lease. Future minimum payments under the Lease during the initial Lease Term are expected to approximate $32.3 million. The Lease contains customary default provisions, including those relating to payment defaults, performance defaults and events of bankruptcy.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements, other than operating leases, that have or are reasonably likely to have a current or future material effect on our financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources. We do not have any interest in special purpose entities, structured finance entities or other variable interest entities.

CRITICAL ACCOUNTING POLICIES

There have been no material changes to our critical accounting policies as disclosed in our Annual Report on Form 10-K for the year ended December 31, 2017. For the required interim disclosure updates related to our accounting policies, see *Note 2* to our consolidated financial statements — *Summary of Significant Accounting Policies* in this Quarterly Report on Form 10-Q.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

As of September 30, 2018, our cash and cash equivalents were in cash accounts or were invested in US treasury bills and money market funds. Our investments in US treasury bills and money market funds are not insured by the federal government.

As of September 30, 2018, we had $450.0 million of Convertible Notes outstanding which bear interest at a coupon rate of 1.75%. If a 10% change in interest rates had occurred on September 30, 2018, it would not have had a material effect on the fair value of our debt as of that date, nor would it have had a material effect on our future earnings or cash flows.

The majority of our business is conducted in US dollars. However, we do conduct certain transactions in other currencies, including Euros, British Pounds, and Japanese Yen. Historically, fluctuations in foreign currency exchange rates have not materially affected our results of operations and during the nine months ended September 30, 2018 and 2017, our results of operations were not materially affected by fluctuations in foreign currency exchange rates.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2018. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities and Exchange Act of 1934, as amended (the Exchange Act), means controls and other procedures that are designed to provide reasonable assurance that information required to be disclosed by us in the periodic reports that we file or submit with the SEC is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms, and to ensure that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure. Based on that evaluation as of September 30, 2018, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures are effective at the reasonable assurance level.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f) under the Exchange Act) during the nine months ended September 30, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

From time to time, we are party to various lawsuits, claims and other legal proceedings that arise in the ordinary course of our business. While the outcomes of these matters are uncertain, management does not expect that the ultimate costs to resolve these matters will have a material adverse effect on our consolidated financial position, results of operations or cash flows.

ITEM 1A. RISK FACTORS

Our business is subject to substantial risks and uncertainties. Any of the risks and uncertainties described below, either alone or taken together, could materially and adversely affect our business, financial condition, results of operations, prospects for growth, and the value of an investment in our common stock. In addition, these risks and uncertainties could cause actual results to differ materially from those expressed or implied by forward-looking statements contained in this Form 10-Q (please read the Cautionary Note Regarding Forward-Looking Statements appearing at the beginning of Management's Discussion & Analysis in this Form 10-Q).

Risks Related to the Commercialization and Continued Approval of ARIKAYCE

Our prospects are highly dependent on the success of our only approved product, ARIKAYCE, which was approved in the United States (US) under the LPAD and accelerated approval pathways. If we are unable to successfully commercialize or maintain approval for ARIKAYCE, our business, financial condition, results of operations and prospects and the value of

our common stock will be materially adversely affected.

Our long-term viability and growth depend on the successful commercialization of ARIKAYCE, our only approved product, which has been approved in the US for the treatment of patients with MAC lung disease as part of a combination antibacterial drug regimen for adult patients with limited or no alternative treatment options. We have invested and continue to invest significant efforts and financial resources in the launch of ARIKAYCE, and our ability to generate revenue from ARIKAYCE will depend heavily on successfully commercializing and obtaining full regulatory approval for ARIKAYCE by conducting an appropriate confirmatory post-marketing study. ARIKAYCE is our first commercial launch, and its successful commercialization and our receipt of full regulatory approval for ARIKAYCE in the US are subject to many risks.

The commercial success of ARIKAYCE will depend on the degree of market acceptance by physicians, patients, third-party payers and others in the health care community.

Despite receiving US Food and Drug Administration (FDA) approval of ARIKAYCE, the product may not gain market acceptance by physicians, patients, third-party payers or others in the health care community. ARIKAYCE was the first product approved via the Limited Population Pathway for Antibacterial and Antifungal Drugs (LPAD) pathway, and there is limited information on how this approval may impact market acceptance of the product. If ARIKAYCE does not achieve an adequate level of acceptance, it is likely that we will not generate material revenue or become profitable. The degree of market acceptance of ARIKAYCE, which we launched in the US early in the fourth quarter of 2018, is also dependent on a number of additional factors, including the following:

- The willingness of the target patient population to use, and of physicians to prescribe, ARIKAYCE;
- The efficacy and potential advantages of ARIKAYCE over alternative treatments;
- The risk and safety profile of ARIKAYCE, including physician and patient concern regarding the boxed warning and other safety precautions resulting from its association with an increased risk of respiratory adverse reactions;
- Relative convenience and ease of administration;
- The ability of the patient to tolerate ARIKAYCE;
- The pricing of ARIKAYCE;
- The ability and willingness of the patient to pay out of pocket costs for ARIKAYCE, for example, co-payments;
- Sufficient third-party insurance coverage and reimbursement;
- The strength of marketing and distribution support and timing of market introduction of competitive products and treatments; and
- Publicity concerning ARIKAYCE or any potential competitive products and treatments.

Our efforts to educate physicians, patients, third-party payers and others in the health care community on the benefits of ARIKAYCE will require significant resources, which may be greater than those required to commercialize more established technologies and may never be successful.

We obtained regulatory approval of ARIKAYCE in the US through an accelerated approval process, and full approval will be contingent on successful completion of a confirmatory post-marketing study. Failure to obtain full approval or otherwise meet our post-marketing requirements and commitments would have a material adverse effect on our business.

The FDA approved ARIKAYCE under the LPAD and accelerated approval pathways, and full approval will be based on results from a post-approval confirmatory clinical trial. Accelerated approval allows drugs that (i) are being developed to treat a serious or life-threatening disease or condition and (ii) provide a meaningful therapeutic benefit over existing treatments to be approved substantially based on an intermediate endpoint or a surrogate endpoint that is reasonably likely to predict clinical benefit, rather than a clinical endpoint such as survival or irreversible morbidity. Accelerated approval of ARIKAYCE was supported by preliminary data from the Phase 3 CONVERT study, which evaluated the safety and efficacy of ARIKAYCE in adult patients with refractory MAC lung disease, using achievement of sputum culture conversion (defined as three consecutive negative monthly sputum cultures) by Month 6 as the primary endpoint.

The required confirmatory trial, which is currently under discussion with FDA, is proposed to be a randomized, double-blind, placebo-controlled clinical trial to assess and describe the clinical benefit of ARIKAYCE in patients with MAC lung disease. The trial will evaluate the effect of ARIKAYCE on a clinically meaningful endpoint, as compared to an appropriate control in the intended patient population of patients with MAC lung disease. Pursuant to the timetable agreed upon with the FDA, the study protocol is scheduled to be finalized in 2019, with trial results to be reported by 2024. There is little precedent for clinical development and regulatory expectations for agents to treat MAC lung disease. As a result, we may encounter challenges designing this trial, including developing and reaching agreement with FDA on the appropriate clinical endpoints. We may encounter substantial delays in enrolling and conducting the trial, and we may not be able to enroll and

conduct the trial in a manner satisfactory to the FDA or within the time period required by the FDA. If the confirmatory trial is not successful, the FDA could, among other things, withdraw its approval of ARIKAYCE. Separate from the confirmatory trial, additional results from ongoing studies, including the CONVERT study and the 312 study, may not be consistent with the positive data generated from those trials to date, which may affect FDA's benefit-risk analysis for the product. Additionally, ARIKAYCE is subject to post-marketing commitments consisting of implementation of a healthcare provider communication plan, conducting a drug utilization assessment, and conducting further studies to identify an optimal quality control in vitro drug release method. Failure to meet post-marketing commitments may raise additional regulatory challenges.

We remain subject to substantial, ongoing regulatory requirements in the US related to ARIKAYCE, and failure to comply with these requirements could lead to enforcement action or otherwise materially harm our business.

ARIKAYCE is subject to a variety of manufacturing, packaging, storage, labeling, advertising, promotion, and record-keeping requirements, including requirements to:

- Conduct sales, marketing and promotion, scientific exchange, speaker programs, charitable donations and educational grant programs in compliance with federal and state laws;
- Disclose clinical trial results on publicly available databases;
- Monitor and report complaints, adverse events and instances of failure to meet product specifications; and
- Comply with current good manufacturing practices (cGMP) and certain quality systems requirements for device components.

Failure to comply with these ongoing regulatory obligations could have significant negative consequences, including:

- Issuance of warning letters or untitled letters by FDA asserting that we are in violation of the law;
- Imposition of injunctions or civil monetary penalties or pursuit by regulators of civil or criminal prosecutions and fines against us or our responsible officers;
- Suspension or withdrawal of regulatory approval;
- Suspension or termination of ongoing clinical trials or refusal by regulators to approve pending marketing applications or supplements to approved applications;
- Seizure of products, required product recalls or refusal to allow us to enter into supply contracts, including government contracts, or to import or export products;
- Suspension of, or imposition of restrictions on, our operations, including costly new manufacturing requirements with respect to ARIKAYCE; and
- Negative publicity, including communications issued by regulatory authorities, which could negatively impact the perception of us or ARIKAYCE by patients, physicians, third party payers or the health care community.

Any of these events could reduce market acceptance of ARIKAYCE, substantially reduce our revenue, increase the costs of operating our business, and cause us significant reputational damage. If we ultimately receive approval for ARIKAYCE in other jurisdictions, we expect to be subject to similar ongoing regulatory oversight by the relevant foreign regulatory authorities.

If we are unable to obtain adequate reimbursement from government or third-party payers for ARIKAYCE or if we are unable to obtain acceptable prices for ARIKAYCE, our prospects for generating revenue and achieving profitability will be materially adversely affected.

Our prospects for generating revenue and achieving profitability depend heavily upon the availability of adequate reimbursement for the use of ARIKAYCE from governmental and other third-party payers, both in the US and in other markets. We expect a substantial majority of ARIKAYCE revenue will come from Medicare reimbursement. Reimbursement by a third-party payer depends upon a number of factors, including the third-party payer's determination that use of a product is:

- A covered benefit under its health plan;
- Safe, effective and medically necessary;
- Appropriate for the specific patient;
- Cost-effective; and
- Neither experimental nor investigational.

The addition of ARIKAYCE to the guidelines of the American Thoracic Society and Infection Diseases Society of America may also be a factor in this determination. Obtaining a determination of coverage and reimbursement for a product from each government or other third-party payer is a time-consuming and costly process that could require us to provide

supporting scientific, clinical and cost-effectiveness data for the use of our products to each payer. We expect that, during the first six to twelve months that we commercialize ARIKAYCE, the payers will evaluate it for inclusion on formularies, during which time patients will need to rely primarily on the medical exception process to secure coverage. For sales after that time, we may not be able to provide data sufficient to gain a positive coverage and reimbursement determination or we might need to conduct post-marketing studies in order to demonstrate the cost-effectiveness of ARIKAYCE to such payers' satisfaction. Such studies might require us to commit a significant amount of management time and financial and other resources. Even when a payer determines that a product is eligible for reimbursement, the payer may impose coverage limitations that preclude payment for some uses that are approved by the FDA or non-US regulatory authorities. Subsequent approvals of competitive products could result in a detrimental change to the reimbursement of our products.

There is a significant focus in the US healthcare industry and elsewhere on drug prices and value, and public and private payers are taking increasingly aggressive steps to control their expenditures for pharmaceuticals by negotiating manufacturer discounts and placing restrictions on reimbursement, and patient access to, medications. These pressures could negatively affect our business. We expect changes in the Medicare program and state Medicaid programs, as well as managed care organizations and other third-party payers, to continue to put pressure on pharmaceutical product pricing. For instance, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) expanded Medicare outpatient prescription drug coverage for the elderly through Part D prescription drug plans sponsored by private entities and authorized such plans to use formularies where they can limit the number of drugs that will be covered in any therapeutic class. The plans generally negotiate significant price concessions as a condition of formulary placement. The MMA also introduced a new reimbursement methodology based on average sales prices for physician-administered drugs, which is generally believed to have resulted in lower Medicare reimbursement for physician-administered drugs. These cost reduction initiatives and other provisions of this legislation provide additional pressure to contain and reduce drug prices and could decrease the coverage and price that we receive for any approved products and could seriously harm our business. Although the MMA applies only to drug benefits for Medicare beneficiaries, private payers often follow Medicare coverage policy and payment limitations when setting their own reimbursement rates, and any reimbursement reduction resulting from the MMA may result in a similar reduction in payments from private payers. Additionally, the Patient Protection and Affordable Care Act (ACA) revised the definition of "average manufacturer price" for reporting purposes and increased the minimum percentage for Medicaid drug rebates to states, and has imposed a significant annual fee on companies that manufacture or import branded prescription drug products. We believe it is likely that the ACA, or any legislation enacted to amend or replace it, will continue the pressure on pharmaceutical pricing, especially under the Medicare program, and also may increase our regulatory burdens and operating costs. Such changes may have a significant impact on our ability to set a product price we believe is fair and may adversely affect our ability to generate revenue and achieve or maintain profitability. We expect further federal and state proposals and health care reforms to continue to be proposed by legislators and/or the US President, which could limit the prices that can be charged for the products we develop and may limit our commercial opportunity. In addition, in connection with various government programs, we are required to report certain pricing information to the government, and the failure to do so may subject us to penalties.

Moreover, in markets outside the US, including countries in the European Union (EU), Japan and Canada, pricing of pharmaceutical products is subject to governmental control. Evaluation criteria used by many EU government agencies for the purposes of pricing and reimbursement typically focus on a product's degree of innovation and its ability to meet a clinical need unfulfilled by currently available therapies. The ACA created a similar entity, the Patient-Centered Outcomes Research Institute, designed to review the effectiveness of treatments and medications in federally-funded health care programs. An adverse result could lead to a treatment or product being removed from Medicare or Medicare coverage. The decisions of such governmental agencies could affect our ability to sell our products profitably.

We have had discussions with third-party payers regarding our price for ARIKAYCE, but our pricing may meet resistance from them and the public generally. If we are unable to obtain adequate reimbursement of ARIKAYCE, the adoption of ARIKAYCE by physicians and patients may be limited. This, in turn, could affect our ability to successfully commercialize ARIKAYCE and adversely impact our business, financial condition, results of operations and prospects and the value of our common stock.

ARIKAYCE could develop unexpected safety or efficacy concerns, which would likely have a material adverse effect on us.

ARIKAYCE was granted accelerated approval from the FDA based on Month 6 data from the CONVERT study. In the US, ARIKAYCE will be used for longer periods of time by larger numbers of patients, and we and others (including regulatory agencies and private payers) will collect extensive information on the efficacy and safety of ARIKAYCE by monitoring its use in the marketplace. In addition, we will conduct a confirmatory trial to assess and describe the clinical benefit of ARIKAYCE in patients with MAC lung disease and may conduct additional trials in connection with lifecycle management programs for ARIKAYCE. New safety or efficacy data from both market surveillance and these clinical trials, which may not be consistent with existing safety and efficacy data from the CONVERT and 312 studies, may result in negative

consequences including the following:

- Modification to product labeling or promotional statements, such as additional boxed or other warnings or contraindications, or the issuance of additional "Dear Doctor Letters" or similar communications to healthcare professionals;
- Required changes in the administration of ARIKAYCE;
- Imposition of additional post-marketing surveillance, post-marketing clinical trial requirements, distribution restrictions or other risk management measures, such as a risk evaluation and mitigation strategy (REMS) or a REMS with elements to assure safe use (ETASU);
- Suspension or withdrawal of regulatory approval;
- Suspension or termination of ongoing clinical trials or refusal by regulators to approve pending marketing applications or supplements to approved applications;
- Suspension of, or imposition of restrictions on, our operations, including costly new manufacturing requirements with respect to ARIKAYCE; and
- Voluntary or mandatory product recalls or withdrawals from the market and costly product liability claims.

Any of these circumstances could reduce ARIKAYCE's market acceptance and would be likely to materially adversely affect our business.

If estimates of the size of the potential markets for ARIKAYCE are overstated, our ability to earn revenue to support our business could be materially adversely affected.

We have relied on currently available information from external sources, including market research funded by us and third parties, and internal analyses and calculations to estimate the potential market opportunities for MAC lung disease in 2018 in the US, where ARIKAYCE has obtained regulatory approval, as well as future jurisdiction in which we may seek approval, including the EU5 (comprised of France, Germany, Italy, Spain and the United Kingdom) and Japan. The externally sourced information used to develop these estimates has been obtained from sources we believe to be reliable, but we have not verified the data from such sources, and their accuracy and completeness cannot be assured. Similarly, our internal analyses and calculations are based upon management's understanding and assessment of numerous inputs and market conditions, including, but not limited to, the projected increase in prevalence of MAC lung disease, Medicare patient population growth and ongoing population shifts to geographies with increased rates of MAC lung disease. These understandings and assessments necessarily require assumptions subject to significant judgment and may prove to be inaccurate. As a result, our estimates of the size of these potential markets for ARIKAYCE could prove to be overstated, perhaps materially.

In addition, we are relying on third party data to identify the physicians who treat the majority of MAC lung disease patients in the US and to determine how to deploy our resources to market to those physicians; however, we may not be marketing to the appropriate physicians and may therefore be limiting our market opportunity.

We may develop estimates with respect to market opportunities for product candidates in the future, and such estimates would be subject to similar risks. In addition, a potential market opportunity could be reduced if a regulator limits the proposed treatment population for one of our product candidates, similar to the limited population for which ARIKAYCE was approved. In either circumstance, even if we obtain regulatory approval, we may be unable to commercialize the product on a scale sufficient to generate material revenue, which could have a material adverse effect on our business, financial condition, results of operations and prospects and the value of our common stock.

We currently are building our marketing and sales organization, and we have limited experience as a company in marketing drug products. If we are unable to successfully market and sell ARIKAYCE, our ability to generate revenue will be adversely affected.

In order to commercialize ARIKAYCE, we must develop marketing, market access, sales and distribution capabilities on our own or make arrangements with third parties for its marketing, sale and distribution. We have commenced commercialization of ARIKAYCE in the US, but we may not be successful in these efforts. The establishment and development of our own sales force is and will continue to be expensive and time-consuming. As a result, we may seek one or more partners to handle some or all of the sales and marketing of ARIKAYCE in certain markets outside the US following approval by the relevant regulatory authority in those markets. However, we may not be able to enter into arrangements with third parties to sell ARIKAYCE on favorable terms or at all. In the event that either our own marketing, market access, and sales force or third-party marketing, market access, and sales organizations are not effective, we would not be able to successfully commercialize ARIKAYCE, which would adversely affect our ability to generate revenue and materially harm us.

ARIKAYCE was approved for treatment in a limited population of patients with MAC lung disease, and additional clinical studies and regulatory applications will be required to expand its indication. We may not be successful in these trials or in obtaining such regulatory approval, which may materially adversely affect our prospects and the value of our common stock.

The FDA granted accelerated approval of ARIKAYCE for the treatment of MAC lung disease as part of a combination antibacterial drug regimen for adult patients with limited or no alternative treatment options. Our CONVERT study and 312 study have focused on this refractory population, and we do not anticipate obtaining an indication for a broader population of patients with MAC lung disease or any other illnesses or infections without additional clinical data. Additional clinical trials will require additional time and expense. We expect to conduct our confirmatory clinical trial for full approval of ARIKAYCE in the broader population of patients with MAC lung disease, but this trial, along with any other clinical trials of ARIKAYCE may not be successful. Additional results from ongoing studies, including the CONVERT study and the 312 study, may not be consistent with the positive data generated from those trials to date, which may affect FDA's benefit-risk analysis for the product. If we are unable to expand the indication for use of ARIKAYCE, our prospects and the value of our common stock may be materially adversely affected.

Risks Related to the Development and Regulatory Approval of Our Product Candidates Generally

Pharmaceutical research and development is very costly and highly uncertain, and we may not succeed in developing product candidates in the future.

Product development in the pharmaceutical industry is an expensive, high-risk, lengthy, complicated, resource intensive process. In order to develop a product successfully, we must, among other things:

- Identify potential product candidates;
- Submit for and receive regulatory approval to perform clinical trials;
- Design and conduct appropriate preclinical and clinical trials, including confirmatory clinical trials, according to good laboratory practices and good clinical practices and disease-specific expectations of the FDA and other regulatory bodies;
- Select and recruit clinical investigators and subjects for our clinical trials;
- Obtain and correctly interpret data establishing adequate safety of our product candidates and demonstrating with statistical significance that our product candidates are effective for their proposed indications, as indicated by satisfaction of pre-established endpoints;
- Submit for and receive regulatory approvals for marketing; and
- Manufacture the product candidates and device components according to cGMP and other applicable standards and regulations.

There is a high rate of failure inherent in this process, and potential products that appear promising at early stages of development may fail for a number of reasons. Importantly, positive results from preclinical studies of a product candidate may not be predictive of similar results in human clinical trials, and promising results from earlier clinical trials of a product candidate may not be replicated in later clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials even after achieving positive results in earlier stages of development and have abandoned development efforts or sought partnerships in order to continue development. For example, the Month 6 data from the CONVERT study and interim durability data from the CONVERT study and interim efficacy data from the 312 study have thus far been positive. However, this data may not be predictive of the efficacy or safety results from the remainder of either the CONVERT study or the 312 study, or future trials related to ARIKAYCE.

In addition, there are many other difficulties and uncertainties inherent in pharmaceutical research and development that could significantly delay or otherwise materially impair our ability to develop future product candidates, including the following:

- Conditions imposed by regulators, ethics committees or institutional review boards for preclinical testing and clinical trials relating to the scope or design of our clinical trials, including selection of endpoints and number of required patients or clinical sites;
- Challenges in designing our clinical trials to support potential claims of superiority over current standard of care or future competitive therapies;
- Restrictions placed upon, or other difficulties with respect to, clinical trials and clinical trial sites, including with respect to potential clinical holds or suspension or termination of clinical trials due to, among other things, potential safety or ethical concerns or noncompliance with regulatory requirements;

- Delayed or reduced enrollment in clinical trials, or high discontinuation rates;
- Failure by third-party contractors, contract research organizations (CROs), clinical investigators, clinical laboratories, or suppliers to comply with regulatory requirements or meet their contractual obligations in a timely manner;
- Greater than anticipated cost of our clinical trials; and
- Insufficient product supply or inadequate product quality.

Failure to successfully develop future product candidates for any of these reasons may materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

We may not be able to obtain regulatory approvals for ARIKAYCE outside of the US or for our product candidates in the US, Europe, Japan or other markets. Any such failure to obtain regulatory approvals may materially adversely affect us.

We are required to obtain various regulatory approvals prior to studying our products in humans and then again before we market and distribute our products, and the failure to obtain such approvals will prevent us from commercializing our products, which would materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock. While we have obtained accelerated approval for ARIKAYCE in the US, seeking approval for ARIKAYCE in other jurisdictions as well as approval for our product candidates in the US and foreign markets presents significant obstacles. Approval processes in the US, Europe and Japan require the submission of extensive preclinical and clinical data, manufacturing and quality information regarding the process and facility, scientific data characterizing our product and other supporting data in order to establish safety and effectiveness. These processes are complex, lengthy, expensive, resource intensive and uncertain. Regulators will also conduct a rigorous review of any trade name we intend to use for our products. Even after they approve a trade name, these regulators may request that we adopt an alternative name for the product if adverse event reports indicate a potential for confusion with other trade names and medication error. If we are required to adopt an alternative name, potential commercialization of ARIKAYCE or our product candidates could be delayed or interrupted. We have limited experience in submitting and pursuing applications necessary to obtain these regulatory approvals.

Data submitted to regulators are subject to varying interpretations that could delay, limit or prevent regulatory agency approval. Even if we believe our clinical trial results are promising, regulators may disagree with our interpretation of data, study design or execution and may refuse to accept our application for review or decline to grant approval. For example, in the fourth quarter of 2014, we filed a marketing authorization application (MAA) with the European Medicines Agency (EMA) for ARIKAYCE as a treatment for, among other things, MAC lung disease in adult patients. The filing was based in part on data from our phase 2 study in patients with MAC lung disease. We subsequently withdrew our MAA after the Committee for Medicinal Products for Human Use concluded that the data submitted did not provide enough evidence to support an approval.

In addition, the grant of a designation by the FDA or approval by the FDA does not ensure a similar decision by the regulatory authorities of other countries, and a decision by one foreign regulatory authority does not ensure regulatory authorities in other foreign countries or the FDA will agree with the decision. For instance, although ARIKAYCE received orphan drug designation in the US, ARIKAYCE did not qualify for orphan drug designation in Japan due to the estimated number of NTM patients in Japan exceeding 50,000. Similarly, clinical studies conducted in one country may not be accepted by regulatory authorities in other countries. Approval procedures vary among countries and can involve additional product testing, including additional preclinical studies or clinical trials, and administrative review periods. The time required to obtain approval in these other territories might differ from that required to obtain FDA approval. We may never obtain approval for ARIKAYCE outside of the US or for our product candidates in the US or other jurisdictions, which would limit our market opportunities and materially adversely affect our business. Even if a product candidate is approved, regulators may limit the indications for which the product may be marketed, require extensive warnings on the product labeling or require expensive and time-consuming additional clinical trials or reporting as conditions of approval.

We are currently assessing regulatory strategies which could expedite the development and regulatory review of INS1007 in the US and the EU, but we may be unsuccessful in pursuing such strategies. The FDA has denied our request for orphan drug designation for INS1007 in on-cystic fibrosis (non-CF) bronchiectasis. In addition, although we believe that INS1009 could be eligible for approval under Section 505(b)(2), and thus could rely at least in part on studies not conducted by or for us and for which we do not have a right of reference, we may not obtain approval from the FDA to use this pathway.

We may also encounter delays or rejections based on changes in regulatory agency policies during the period in which we develop a product and the period required for review of any application for regulatory agency approval of a particular product. Resolving such delays could force us or third parties to incur significant costs, limit our allowed activities or the allowed activities of third parties, diminish any competitive advantages that we or our third parties may attain or adversely affect our ability to receive royalties, any of which could materially adversely affect our business, financial condition, results of

operations and prospects and the value of our common stock.

For ARIKAYCE to be commercialized in a given market, in addition to regulatory approvals required for ARIKAYCE, the Lamira Nebulizer System must satisfy certain regulatory requirements and its use as a delivery system for ARIKAYCE must be approved or cleared by regulators.

ARIKAYCE is administered using the Lamira Nebulizer System, and the Lamira Nebulizer System must receive regulatory approval or clearance on its own or in conjunction with ARIKAYCE as a combination product in order for us to develop and commercialize ARIKAYCE in a given market. The FDA granted accelerated approval of the Lamira Nebulizer System with ARIKAYCE as part of approval of the drug/device combination product, and the Lamira Nebulizer System is CE marked by PARI in the EU. However, outside the US and EU, the Lamira Nebulizer System is labeled as investigational for use in our clinical trials, including in Japan, Canada and Australia, and is not approved for commercial use in Japan, Canada or certain other markets in which we may seek to commercialize ARIKAYCE in the future.

If we seek regulatory approval in markets in which the Lamira Nebulizer System is not approved and we and PARI are not successful in obtaining approval for the Lamira Nebulizer System, our ability to commercialize ARIKAYCE in those markets would be materially impaired. In addition, failure to maintain regulatory approval or clearance of the Lamira Nebulizer System could result in increased development costs, withdrawal of regulatory approval, and delays in ARIKAYCE reaching the market. Failure to obtain or maintain regulatory approval or clearance of the Lamira Nebulizer System could result in potential loss of regulatory approval or otherwise materially harm our business.

We have limited experience conducting and managing the preclinical development activities and clinical trials necessary to obtain regulatory approvals, and we may not succeed in doing so in the future.

ARIKAYCE is our first approved product candidate since our merger with Transave, and we have limited experience in conducting and managing the preclinical development activities and clinical trials necessary to obtain regulatory approvals, including approval by the FDA, EMA, Ministry of Health, Labour and Welfare (MHLW), and Pharmaceuticals and Medical Devices Agency (PMDA), which might prevent us from successfully designing, implementing, or completing the clinical trials required to support regulatory approval of our product candidates. The application processes for the FDA, MHLW, PMDA, EMA and other regulatory agencies are complex and difficult and vary by regulatory agency, and we might not be able to demonstrate that our product candidates meet the appropriate standards for regulatory approval or commercialize our product candidates in the US or elsewhere, or commercialize ARIKAYCE in jurisdictions outside of the US, or we might be significantly delayed in doing so. In such circumstances, our business, financial condition, results of operations and prospects and the value of our common stock may be materially adversely affected.

If our clinical studies do not produce positive results or our clinical trials are delayed, or if serious side effects are identified during drug development, we may experience delays, incur additional costs and ultimately be unable to commercialize our product candidates in the US, Europe, Japan or other markets.

Before obtaining regulatory approval for the sale of our product candidates, we must conduct, at our own expense, extensive preclinical tests to demonstrate the safety of our product candidates in animals, and clinical trials to demonstrate the safety and efficacy of our product candidates in humans. If we experience delays in our clinical trials or other testing or the results of these trials or tests are not positive or are only modestly positive, including with respect to safety, we may:

- Experience increased product development costs;
- Be delayed in obtaining, or be unable to obtain, regulatory approval for one or more of our product candidates;
- Obtain approval for indications or patient populations that are not as broad as intended or entirely different than those indications for which we sought approval or with labeling with boxed warnings or other warnings or contraindications;
- Need to change the way the product is administered;
- Be required to perform additional clinical trials to support approval or be subject to additional post-marketing testing requirements;
- Have regulatory authorities withdraw, or suspend, their approval of the product or impose risk mitigation strategies such as restrictions on distribution or other REMS;
- Face a shortened patent protection period during which we may have the exclusive right to commercialize our products;
- Have competitors that are able to bring similar products to market before us;
- Be sued for alleged injuries caused to patients using our products; or
- Suffer reputational damage.

Such circumstances would impair our ability to commercialize our products and harm our business and results of operations.

We may not be able to enroll enough patients to complete our clinical trials or retain a sufficient number of patients in our clinical trials to generate the data necessary for regulatory approval of our product candidates.

The completion rate of our clinical trials is dependent on, among other factors, the patient enrollment rate. Patient enrollment is a function of many factors, including:

- Investigator identification and recruitment;
- Regulatory approvals to initiate study sites;
- Patient population size;
- The nature of the protocol to be used in the trial;
- Patient proximity to clinical sites;
- Eligibility criteria for the trial;
- Patient willingness to participate in the trial;
- Discontinuation rates; and
- Competition from other companies' potential clinical trials for the same patient population.

Delays in patient enrollment for our clinical trials, including in the confirmatory clinical trial for ARIKAYCE and the WILLOW study, our global phase 2 study of INS1007 in non-CF bronchiectasis that currently is enrolling patients, like those we encountered in enrolling the CONVERT study, could increase costs and delay commercialization and sales, if any, of our products. Once enrolled, patients may elect to discontinue participation in a clinical trial at any time. If patients elect to discontinue participation in our clinical trials at a higher rate than expected, we may be unable to generate the data required by regulators for approval of our product candidates.

Risks Related to Our Reliance on Third Parties

We rely on third parties including collaborators, CROs, clinical and analytical laboratories, contract manufacturing organizations (CMOs) and other providers for many services that are critical to our business. If we are unable to form and sustain these relationships, or if any third-party arrangements that we may enter into are unsuccessful, including due to non-compliance by such third parties with our agreements or applicable law, our ability to develop and commercialize our products may be materially adversely affected.

We currently rely, and expect to continue to rely, on third parties for significant research, analytical services, preclinical development, clinical development and manufacturing of our product candidates and commercial scale manufacturing of ARIKAYCE. For example, we do not own facilities for clinical-scale or commercial manufacturing of our product candidates, and we currently rely on Therapure Biopharma Inc. (Therapure) and Ajinimoto Althea, Inc. (Althea) to provide our clinical and commercial supply of ARIKAYCE. Additionally, almost all of our clinical trial work is done by CROs, such as SynteractHCR, Inc., our CRO for both the CONVERT and 312 studies, and clinical laboratories. Reliance on these third parties poses a number of risks, including the following:

- The diversion of management time and cost of third-party advisers associated with the negotiation, documentation and implementation of agreements with third parties in the pharmaceutical industry;
- The inability to control whether third parties devote sufficient resources to our programs or products, including with respect to meeting contractual deadlines;
- The inability to control the regulatory and contractual compliance of third parties, including their quality systems, processes and procedures, systems utilized to collect and analyze data, and equipment used to test drug product and/or clinical supplies;
- The inability to establish and implement collaborations or other alternative arrangements on favorable terms;
- Disputes with third parties, including CROs, leading to loss of intellectual property rights, delay or termination of research, development, or commercialization of product candidates or litigation or arbitration;
- Contracts with our collaborators fail to provide sufficient protection of our intellectual property; and
- Difficulty enforcing our contractual rights if one of these third parties fails to perform.

We also rely on third parties to select and enter into agreements with clinical investigators to conduct clinical trials to support approval of our product candidates, and the failure of these third parties to appropriately carry out such evaluation and

selection can adversely affect the quality of the data from these studies and, potentially, the approval of our products. In particular, as part of future drug approval submissions to the FDA, we must disclose certain financial interests of investigators who participated in any of the clinical studies being submitted in support of approval, or must certify to the absence of such financial interests. The FDA evaluates the information contained in such disclosures to determine whether disclosed interests may have an impact on the reliability of a study. If the FDA determines that financial interests of any clinical investigator raise serious questions of data integrity, the FDA can institute a data audit, request that we submit further data analyses, conduct additional independent studies to confirm the results of the questioned study, or refuse to use the data from the questioned study as a basis for approval. A finding by the FDA that a financial relationship of an investigator raises serious questions of data integrity could delay or otherwise adversely affect approval of our products.

These risks could materially harm our business, financial condition, results of operations and prospects and the value of our common stock.

We may not have, or may be unable to obtain, sufficient quantities of ARIKAYCE or our product candidates to meet our required supply for commercialization or clinical studies, which would materially harm our business.

We do not have any in-house manufacturing capability other than for small-scale pre-clinical development programs and depend completely on a small number of third-party manufacturers and suppliers for the manufacture of our product candidates on a clinical or commercial scale. For instance, we are and expect to remain dependent upon Therapure, Althea and eventually Patheon to supply ARIKAYCE both for our clinical trials and commercial sale. Althea currently manufactures ARIKAYCE at a relatively small scale. We also funded a manufacturing expansion at Therapure, which operates at a larger scale than Althea. ARIKAYCE currently has a limited shelf life, and we may not be able to maintain adequate quantities to meet future demand. As additional supporting data becomes available, we believe the current approved shelf life for product manufactured at our CMOs will increase. If we encounter delays or difficulties in the manufacturing process that disrupt our ability to supply our distributors with ARIKAYCE, we may experience a product stock-out, which would likely have a material adverse effect on our business and reputation. In addition, we have entered into certain agreements with Patheon related to increasing our long-term production capacity for ARIKAYCE commercial inventory, although Patheon's supply obligations will commence only after certain technology transfer and construction services are completed. Any delay in the commencement of Patheon's supply obligations, whether due to delays in technology transfer and construction or from adding Patheon to our New Drug Application (NDA) as a CMO, would increase the risks associated with either Therapure or Althea being unable to provide us with an adequate supply of ARIKAYCE.

We are also dependent upon PARI being able to provide an adequate supply of nebulizers both for commercial sale of ARIKAYCE and any ongoing clinical trials, as PARI is the sole manufacturer of the Lamira Nebulizer System. We have no alternative supplier for the nebulizer, and because significant effort and time were expended in the optimization of the nebulizer for use with ARIKAYCE, we do not intend to seek an alternative or secondary supplier. In the event PARI cannot provide us with sufficient quantities of the nebulizer, replication of the optimized device by another party would likely require considerable time and additional regulatory approval. In the case of certain specified supply failures, we have the right under our commercialization agreement with PARI to make the nebulizer and have it made by certain third parties, but not those deemed under the commercialization agreement to compete with PARI.

We do not have long-term commercial agreements with all of our suppliers and if any of our suppliers are unable or unwilling to perform for any reason, we may not be able to locate suppliers or enter into favorable agreements with them.

An inadequate supply of ARIKAYCE or the Lamira Nebulizer System could harm our commercial efforts or delay or impair clinical trials of ARIKAYCE or our product candidates and adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

The manufacturing facilities of our third-party manufacturers are subject to significant government regulations and approvals, which are often costly and could result in adverse consequences to our business if we and our manufacturing partners fail to comply with the regulations or maintain the approvals.

Manufacturers of ARIKAYCE and our product candidates are subject to cGMP and similar standards, and while we have policies and procedures in place to select manufacturers that adhere, and monitor their adherence to, such standards, they may nonetheless fail to do so. These manufacturers and their facilities will be subject to periodic review and inspections by the FDA and other regulatory authorities following regulatory approval of our products, as with ARIKAYCE. For instance, to monitor compliance with applicable regulations, the FDA routinely conducts inspections of facilities and may identify potential deficiencies. The FDA issues what are referred to as "FDA Form 483s" that set forth observations and concerns identified during its inspections. Failure to satisfactorily address the concerns or potential deficiencies identified in a Form 483 could

result in the issuance of a warning letter, which is a notice of the issues that the FDA believes to be significant regulatory violations requiring prompt corrective actions. Failure to respond adequately to a warning letter, or to otherwise fail to comply with applicable regulatory requirements could result in enforcement, remedial and/or punitive actions by the FDA or other regulatory authorities.

If one of our manufacturers fails to maintain compliance with regulatory requirements or experiences supply problems, including in the scale-up of commercial production, the production of ARIKAYCE and our product candidates could be interrupted, resulting in delays, additional costs or restrictions on the marketing or sale of our products. An alternative manufacturer would need to be qualified, through regulatory filings, which could result in further delay. The regulatory authorities may also require additional testing if a new manufacturer is relied upon for commercial production. In addition, with respect to our product candidates, our manufacturers and their facilities are subject to pre-approval cGMP inspection by the FDA and other regulatory authorities, and the findings of the cGMP inspection could result in a failure to obtain, or a delay in obtaining, regulatory approval for future product candidates.

Risks Related to the Operation of our Business

We are dependent upon retaining and attracting key personnel, the loss of whose services could materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

We depend heavily on our management team and our principal clinical and commercial personnel, the loss of whose services might significantly delay or prevent the achievement of our research, development or commercialization objectives. Our success depends, in large part, on our ability to attract and retain qualified management, clinical and commercial personnel, and on our ability to develop and maintain important relationships with commercial partners, leading research institutions and key distributors.

Competition for skilled personnel in our industry and market is intense because of the numerous pharmaceutical and biotechnology companies that seek similar personnel. These companies may have greater financial and other resources, offer a greater opportunity for career advancement and have a longer history in the industry than we do. We also experience competition for the hiring of our clinical and commercial personnel from universities, research institutions, and other third parties. We cannot assure that we will attract and retain such persons or maintain such relationships. Our inability to retain and attract qualified employees would materially harm our business, financial condition, results of operations and prospects and the value of our common stock.

We expect to expand our development, regulatory and sales and marketing capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

In connection with our commercial launch of ARIKAYCE and international expansion, we expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of drug development, regulatory affairs, quality, commercial compliance, medical affairs, and sales and marketing. For example, we plan to hire additional personnel in connection with our commercial launch of ARIKAYCE and preparation for potential regulatory filings for ARIKAYCE in other markets. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to the limited experience of our management team in managing a company with this anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The physical expansion of our operations may lead to significant costs and may divert our management and business development resources. We may not be able to effectively manage the expansion of our operations, which could delay the execution of our business plans or disrupt our operations.

Any acquisitions we make, or collaborative relationships we enter into, may not be clinically or commercially successful, and may require financing or a significant amount of our available cash, which could adversely affect our business.

As part of our business strategy, we may effect acquisitions to obtain additional businesses, products, technologies, capabilities and personnel. Acquisitions involve a number of operational risks, including:

- Failure to achieve expected synergies;
- Difficulty and expense of assimilating the operations, technology and personnel of any acquired business;
- The inability to retain the management, key personnel and other employees of any acquired business;
- The inability to maintain any acquired company’s relationship with key third parties, such as alliance partners;
- Exposure to legal claims for activities of any acquired business prior to acquisition;

- Diversion of our management's attention from our core business; and
- Potential impairment of intangible assets, adversely affecting our reported results of operations and financial condition.

We also may enter into collaborative relationships that would involve our collaborators conducting proprietary development programs. Disagreements with collaborators may develop over the rights to our intellectual property, and any conflict with our collaborators could limit our ability to obtain future collaboration agreements and negatively influence our relationship with existing collaborators.

If we make one or more significant acquisitions or enter into a significant collaboration in which the consideration includes cash, we may be required to use a substantial portion of our available cash and/or need to raise additional capital, which could adversely affect our financial condition.

We may be subject to product liability claims, and we have only limited product liability insurance.

The manufacture and sale of human therapeutic products involve an inherent risk of product liability claims, particularly as we now commercialize ARIKAYCE in the US. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for ARIKAYCE and any other products that we may commercialize, and a corresponding loss of revenue;
- substantial monetary awards to patients or trial participants;
- significant time and costs to defend the related litigation;
- withdrawal or reduced enrollment of clinical trial participants; and
- reputational harm and significant negative media attention.

We currently have only limited product liability insurance for our products. We do not know if we will be able to maintain existing, or obtain additional, product liability insurance on acceptable terms or with adequate coverage against potential liabilities. This type of insurance is expensive and may not be available on acceptable terms. If we are unable to obtain or maintain sufficient insurance coverage on reasonable terms or to otherwise protect against potential product liability claims, we may be unable to commercialize our products. A successful product liability claim brought against us in excess of our insurance coverage, if any, may require us to pay substantial amounts and may materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

Our business and operations, including our drug development programs, could be materially disrupted in the event of system failures, security breaches, violations of data protection laws or data loss or damage by us or our CROs or other contractors or consultants.

Despite the implementation of security measures, our internal computer systems and those of our CROs and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. If such an event were to occur and cause interruptions in our operations, it could have a material adverse effect on our business operations, including a material disruption of our drug development and commercialization programs. Unauthorized disclosure of sensitive or confidential patient or employee data, including personally identifiable information, whether through breach of computer systems, systems failure, employee negligence, fraud or misappropriation, or otherwise, or unauthorized access to or through our information systems and networks, whether by our employees or third parties, could result in negative publicity, legal liability and damage to our reputation. Unauthorized disclosure of personally identifiable information could also expose us to sanctions for violations of data privacy laws and regulations around the world. To the extent that any disruption or security breach resulted in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development of our product candidates could be delayed. For example, the loss of or damage to clinical trial data, such as from completed or ongoing clinical trials, for any of our product candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data.

Although we have general liability insurance coverage, including coverage for errors and omissions, our insurance may not cover all claims, continue to be available on reasonable terms or be sufficient in amount to cover one or more large claims; additionally, the insurer may disclaim coverage as to any claim. The successful assertion of one or more large claims against us that exceed or are not covered by our insurance coverage or changes in our insurance policies, including premium increases or the imposition of large deductible or co-insurance requirements, could have a material adverse effect on our business, financial condition, results of operations and prospects and the value of our common stock.

We have limited experience operating internationally, are subject to a number of risks associated with our international activities and operations and may not be successful in our efforts to expand internationally.

We currently have limited operations outside of the US. As of September 30, 2018, we had 27 employees located in Europe and 5 employees located in Japan, although we have clinical trial sites and suppliers located around the world. In order to meet our long-term goals, we expect to grow our international operations over the next several years, including in Europe and Japan, and continue to source material used in the manufacture of our product candidates from abroad. Consequently, we are and will continue to be subject to risks related to operating in foreign countries, including:

- Limited experience with international regulatory requirements;
- An inability to achieve optimal pricing and reimbursement for ARIKAYCE, if approved in another jurisdiction, or subsequent changes in reimbursement, pricing and other regulatory requirements;
- Any implementation of, or changes to, tariffs, trade barriers and other import-export regulations in the US or other countries in which we, or our third-party partners, operate;
- Unexpected adverse events related to ARIKAYCE or our product candidates occurring in foreign markets that we have not experienced in the US;
- Economic and political conditions, including geopolitical events, such as war and terrorism, foreign currency fluctuations and inflation, which could result in reduced revenue, increased or unpredictable operating expenses and other obligations incident to doing business in, or with a company located in, another country;
- Changes resulting from the UK's vote to exit the EU, including: (i) the uncertainty and instability in economic and market conditions; (ii) the uncertainty regarding the UK's access to the EU Single Market and the impact on the wider trading, legal, regulatory and labor environments; and (iii) the uncertainty in the European regulatory framework, including the relocation of the EMA from the UK to the Netherlands, and the subsequent potential disruption and delay of EMA regulatory actions; and
- Compliance with foreign or US laws, rules and regulations, including data privacy requirements, labor relations laws, tax laws, anti-competition regulations, import, export and trade restrictions, anti-bribery/anti-corruption laws, regulations or rules, which could lead to actions by us or our licensees, distributors, manufacturers, other third parties who act on our behalf or with whom we do business in foreign countries or our employees who are working abroad that could subject us to investigation or prosecution under such foreign or US laws.

These and other risks associated with our international operations may materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

We operate in a highly competitive and changing environment, and if we are unable to adapt to our environment, we may be unable to compete successfully.

Biotechnology and related pharmaceutical technology have undergone and are likely to continue to experience rapid and significant change. Our future success will depend in large part on our ability to maintain a competitive position with respect to these technologies and to obtain and maintain protection for our intellectual property. Compounds, products or processes that we develop may become obsolete before we recover any expenses incurred in connection with their development. We face substantial competition from pharmaceutical, biotechnology and other companies, universities and research institutions with respect to nontuberculous mycobacteria (NTM) lung disease, bronchiectasis, and pulmonary arterial hypertension (PAH). Relative to us, most of these entities have substantially greater capital resources, research and development staffs, facilities and experience in conducting clinical studies, obtaining regulatory approvals, and manufacturing and marketing pharmaceutical products. Many of our competitors may achieve product commercialization or obtain patent protection earlier than us. Furthermore, we believe that our competitors have used, and may continue to use, litigation to gain a competitive advantage. Our competitors may also use different technologies or approaches to develop products similar to ARIKAYCE and our product candidates.

We expect that competing successfully will depend, among other things, on the relative speed with which we can develop products, complete the clinical testing and regulatory approval processes and supply commercial quantities of the product to the market, as well as product efficacy, safety, reliability, availability, timing and scope of regulatory approval and price. We expect competition to increase as technological advances are made and commercial applications broaden. There are potential competitive products, both approved and in development, which include oral, systemic, or inhaled antibiotic products to treat chronic respiratory infections. For instance, certain entities have expressed interest in studying their products for NTM lung disease and are seeking to advance studies in NTM lung disease caused by mycobacterial species other than MAC; however, we are not aware of any entities currently conducting clinical trials for the treatment of refractory MAC lung disease or of any other approved inhaled therapies specifically indicated for NTM lung disease in North America, Japan or Europe. If any of our competitors develops a product that is more effective, safe, tolerable or, convenient or less expensive than

ARIKAYCE or our product candidates, it would likely materially adversely affect our ability to generate revenue. We also may face lower priced generic competitors if third-party payers encourage use of generic or lower-priced versions of our product or if competing products are imported into the US or other countries where we may sell ARIKAYCE.

In addition, there are other amikacin products that have been approved by the FDA, MHLW and other regulatory agencies for use in other indications, and physicians may elect to prescribe those products rather than ARIKAYCE to treat the indications for which ARIKAYCE has received approval, which is commonly referred to as off-label use. Although regulations prohibit a drug company from promoting off-label use of its product, the FDA and other regulatory agencies do not regulate the practice of medicine and cannot direct physicians as to what product to prescribe to their patients. As a result, we would have limited ability to prevent any off-label use of a competitor's product to treat diseases for which we have received FDA or other regulatory agency approval, even if this use violates our patents or any statutory exclusivities that FDA may grant for the use of amikacin to treat such diseases. If we are unable to compete successfully, it will materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

Risks Related to Our Intellectual Property

If we are unable to protect our intellectual property rights adequately, the value of ARIKAYCE and our product candidates could be materially diminished.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain and involves complex legal, technical, scientific and factual questions, and our success depends in large part on our ability to protect our proprietary technology and to obtain and maintain patent protection for our products, prevent third parties from infringing our patents, both domestically and internationally. We have sought to protect our proprietary position by filing patent applications in the US 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. Our existing patents and any future patents we obtain may not be sufficiently broad to prevent others from using our technologies or from developing competing products and technologies.

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 or otherwise provide us with any competitive advantage. Any conclusions we may reach regarding non-infringement, inapplicability or invalidity of a third party's intellectual property vis-à-vis our proprietary rights, or those of a licensor, are based in significant part on a review of publicly available databases and other information. There may be information not available to us or otherwise not reviewed by us that could render these conclusions inaccurate. Our competitors may also be able to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner.

Additionally, patents issued to us or our licensors may be challenged, narrowed, invalidated, held to be unenforceable or circumvented through litigation, which could limit our ability to stop competitors from marketing similar products or reduce the term of patent protection for amikacin liposome inhalation suspension or our product candidates. US patents and patent applications may also be subject to interference or derivation proceedings, and US patents may be subject to re-examination proceedings, reissue, post-grant review and/or *inter partes* review in the US Patent and Trademark Office. Foreign patents may be subject to opposition or comparable proceedings in the corresponding foreign patent office, which could result in either loss of the patent or denial of the patent application or loss or reduction in the scope of one or more of the claims of the patent or patent application. See *Intellectual Property - ARIKAYCE Patents and Trade Secrets* in Item 1 of Part I of our Annual Report on Form 10-K for the year ended December 31, 2017 (2017 Annual Report) for more information on our European patent that was previously opposed, the decision of which is now under appeal by Generics (UK) Ltd. Another of our European patents has been opposed by Generics (UK) Ltd. and was revoked in November 2017. We intend to appeal that decision, and the patent remains enforceable during the appeal. These European patents have statutory expiration dates in 2026 and 2023, respectively, not including additional term that might be added via a Supplementary Protection Certificate.

Changes in either patent laws or in interpretations of patent laws in the US and other countries may also diminish the value of our intellectual property or narrow the scope of our patent protection, including making it easier for competitors to challenge our patents. For example, the America Invents Act included a number of changes to established practices, including the transition to a first-inventor-to-file system and new procedures for challenging patents and implementation of different methods for invalidating patents.

If we are not able to adequately prevent disclosure of trade secrets and other proprietary information, the value of

ARIKAYCE and our product candidates could be materially diminished.

We rely on trade secrets to protect our proprietary technologies, especially where we do not believe patent protection is appropriate or obtainable. However, trade secrets are difficult to protect. We rely in part on confidentiality agreements with our employees, consultants, advisors, collaborators, and other third parties and partners to protect our trade secrets and other proprietary information. These agreements may not effectively prevent disclosure of confidential information or may not provide an adequate remedy in the event of unauthorized disclosure of confidential information. In addition, third parties may independently develop or discover our trade secrets and proprietary information. Regulators also may disclose information we consider to be proprietary to third parties under certain circumstances, including in response to third-party requests for such disclosure under the Freedom of Information Act or comparable laws. Additionally, the FDA, as part of its Transparency Initiative, continues to consider whether to make additional information publicly available on a routine basis, including information that we may consider to be trade secrets or other proprietary information, and it is not clear at the present time whether and how the FDA's disclosure policies may change in the future.

We may not be able to enforce our intellectual property rights throughout the world, which could harm our business.

The legal systems of some foreign countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, especially those relating to life sciences. Many companies have encountered significant problems in protecting and defending intellectual property rights in such foreign jurisdictions. For example, certain foreign countries have compulsory licensing laws under which a patent owner may be required to grant licenses to third parties. In addition, many countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. This legal environment could make it difficult for us to stop the infringement of our patents or in-licensed patents or the misappropriation of our other intellectual property rights. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, and our efforts to protect our intellectual property rights in such countries may be inadequate.

The drug research and development industry has a history of intellectual property litigation, and we could become involved in costly intellectual property disputes, which could delay or impair our product development efforts or prevent us from, or increase the cost of, commercializing ARIKAYCE or any other approved product candidate.

Third parties may claim that we have infringed upon or misappropriated their proprietary rights. Any existing third-party patents, or patents that may later issue to third parties, could negatively affect our commercialization of ARIKAYCE, INS1007, INS1009 or any other product candidate that receives regulatory approval. For instance, PAH is a competitive indication with established products, including other formulations of treprostinil. Our supply of the active pharmaceutical ingredient for INS1009 is dependent upon a single supplier. The supplier owns patents on its manufacturing process, and we have filed patent applications for INS1009; however, a competitor in the PAH indication may claim that we or our supplier have infringed upon or misappropriated its proprietary rights. Moreover, in the event that we pursue approval of INS1009, or any other product candidate, via the 505(b)(2) regulatory pathway, we will be required to file a certification against any unexpired patents listed in the Orange Book for the third-party drug we rely upon as part of our regulatory submission. This certification process may lead to litigation and could also delay launch of a product candidate, if approved by regulators.

In the event of successful litigation or settlement of claims against us for infringement or misappropriation of a third party's proprietary rights, as in 2007 with respect to IPLEX, we may be required to take actions including but not limited to the following:

- Paying damages, including up to treble damages, royalties, and the other party's attorneys' fees, which may be substantial;
- Ceasing development, manufacture, marketing and sale of products or use of processes that infringe the proprietary rights of others;
- Expending significant resources to redesign our products or our processes so that they do not infringe the proprietary rights of others, which may not be possible, or may result in significant regulatory delays associated with conducting additional clinical trials or other steps to obtain regulatory approval; and/or
- Acquiring one or more licenses from third parties, which may not be available to us on acceptable terms or at all.

We may also have to undertake costly litigation or engage in other proceedings, such as interference or *inter partes* review, to enforce or defend the validity of any patents issued or licensed to us, to confirm the scope and validity of our or a licensor's proprietary rights or to defend against allegations that we have infringed a third party's intellectual property rights.
Any proceedings regarding our intellectual property rights are likely to be time consuming and may divert management

attention from operation of our business, and could have a material adverse effect on our business, financial condition, results of operations and prospects and the value of our common stock.

Certain of our existing license agreements include, and our future license agreements also may include, restrictions on our ability to freely develop or commercialize the product candidates that are subject to those agreements. If we fail to comply with our obligations under these agreements, or if these license agreements are terminated for other reasons, we could lose license rights that are important to our business.

We are a party to licensing agreements with PARI and AstraZeneca, which we view as material to our business. For additional information regarding the terms of these agreements, see *Business - License and Other Agreements* in Item 1 of Part I of our 2017 Annual Report. Under our license agreement with AstraZeneca, AstraZeneca retains a right of first negotiation pursuant to which it may exclusively negotiate with us before we can negotiate with a third party regarding any transaction to develop or commercialize INS1007, subject to certain exceptions. While this right of first negotiation is not triggered by a change of control, it may impede or delay our ability to consummate certain other transactions involving INS1007.

Additionally, if we fail to comply with our obligations under the agreements with PARI and AstraZeneca, our counterparty may have the right to take action against us, up to and including termination of the relevant license. For instance, under our licensing agreement with PARI, with respect to NTM lung disease, CF and bronchiectasis, we have specific obligations to use commercially reasonable efforts to achieve certain developmental and regulatory milestones by set deadlines. Additionally, for NTM lung disease, we are obligated to use commercially reasonable efforts to achieve certain commercial milestones in Europe. The consequences of our failing to use commercially reasonable efforts to achieve certain commercial milestones are context-specific, but include ending PARI's non-compete obligation, making the license non-exclusive and terminating the license, in each case with respect to the applicable indication. Similarly, under our license agreement with AstraZeneca, AstraZeneca may terminate our license to INS1007 if we fail to use commercially reasonable efforts to develop and commercialize a product based on INS1007, or we are subject to a bankruptcy or insolvency. Reduction or elimination of our licensed rights may result in our having to negotiate new or reinstated licenses with less favorable terms and may materially harm our business.

Finally, if we do not proceed with the development of our ARIKAYCE program in the NTM lung disease or CF indications, certain of our contract counterparties may elect to proceed with the development of these indications.

Risks Related to Government Regulation

Government health care reform could materially increase our costs, which could materially adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

Our industry is highly regulated and changes in or revisions to laws and regulations that make gaining regulatory approval, reimbursement and pricing more difficult or subject to different criteria and standards may adversely impact our business, operations or financial results.

The Administration and the majority party in both Houses of Congress have indicated their ongoing desire to repeal the ACA and, in December 2017, repealed the ACA's individual mandate, i.e., the penalty imposed on individuals who do not obtain health care coverage. It is unclear what the effect of this partial repeal will be and whether, when and how repeal of other sections of the law may be effectuated and what the effect on the healthcare sector will be. In addition, there is currently litigation challenging the constitutionality of the entire ACA. It is unclear what the outcome of this litigation, and the effect of that outcome on the healthcare sector, will be. The US President has indicated an interest in having the federal government negotiate drug prices with pharmaceutical manufacturers. Changes to the ACA, to the Medicare or Medicaid programs, or to the ability of the federal government to negotiate drug prices, or other federal legislation regarding healthcare access, financing or legislation in individual states, could affect our business, financial condition, results of operations and prospects and the value of our common stock. It remains unclear how any new legislation or regulation might affect the prices we may obtain for ARIKAYCE or any of our product candidates for which regulatory approval is obtained.

If we are found in violation of federal or state "fraud and abuse" laws, we may be required to pay a penalty or may be suspended from participation in federal or state health care programs, which may adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

In the US, we are subject to various federal and state health care "fraud and abuse" laws, including anti-kickback laws, false claims laws and other laws intended to reduce fraud and abuse in federal and state health care programs. Although we seek to structure our business arrangements in compliance with all applicable requirements, these laws are broadly written, and

it is often difficult to determine precisely how the law will be applied in specific circumstances. Accordingly, it is possible that our practices may be challenged under these laws. Violations of fraud and abuse laws may be punishable by criminal and/or civil sanctions, including fines or exclusion or suspension from federal and state health care programs such as Medicare and Medicaid and debarment from contracting with the US government, and our business, financial condition, results of operations and prospects and the value of our common stock may be adversely affected. Our reputation could also suffer. In addition, private individuals have the ability to bring actions on behalf of the government under the federal False Claims Act as well as under the false claims laws of several states.

Under the ACA, we are required to report information on payments or transfers of value to US physicians and teaching hospitals as well as investment interests held by physicians and their immediate family members, which is posted in searchable form on a public website. Failure to submit required information may result in civil monetary penalties.

Several states also impose other marketing restrictions or require pharmaceutical companies to make marketing or price disclosures to the state. In addition to the federal government, some states, as well as other countries, including France, require the disclosure of certain payments to health care professionals. Health record privacy laws may limit access to information identifying those individuals who may be prospective users. There are ambiguities as to what is required to comply with these state requirements, and we could be subject to penalties if a state determines that we have failed to comply with an applicable state law requirement.

We are subject to anti-corruption laws and trade control laws, as well as other laws governing our operations. If we fail to comply with these laws, we could be subject to negative publicity, civil or criminal penalties, other remedial measures, and legal expenses, which could adversely affect our business, financial condition, results of operations and prospects and the value of our common stock.

Our operations are subject to anti-corruption laws, including the US Foreign Corrupt Practices Act (FCPA), the UK Bribery Act and other anti-corruption laws that apply in countries where we do business. The FCPA, UK Bribery Act and these other laws generally prohibit us, our employees and our intermediaries from making prohibited payments to government officials or other persons to obtain or retain business or gain some other business advantage. The CONVERT study includes more than 125 sites in 18 countries, and we are conducting the 312 study and plan to conduct the WILLOW study, our global phase 2 study of INS1007 in non-CF bronchiectasis, at a broad range of trial sites around the world. Certain of these jurisdictions pose a risk of potential FCPA violations, and we have relationships with third parties whose actions could potentially subject us to liability under the FCPA or local anti-corruption laws. In addition, we cannot predict the nature, scope or effect of future regulatory requirements to which our international operations might be subject or the manner in which existing laws might be administered or interpreted.

We are also subject to other laws and regulations governing our international operations, including regulations administered by the US Department of Commerce's Bureau of Industry and Security, the US Department of Treasury's Office of Foreign Assets Control, and various non-US government entities, including applicable export control regulations, economic sanctions on countries and persons, customs requirements, currency exchange regulations and transfer pricing regulations (collectively, Trade Control laws).

We may not be effective in ensuring our compliance with all applicable anti-corruption laws, including the FCPA or other legal requirements, including Trade Control laws. If we are not in compliance with the FCPA and other anti-corruption laws or Trade Control laws, we may be subject to criminal and civil penalties, disgorgement and other sanctions and remedial measures, and legal expenses, which could have an adverse impact on our business, financial condition, results of operations and prospects and the value of our common stock. Likewise, even an investigation by US or foreign authorities of potential violations of the FCPA other anti-corruption laws or Trade Control laws could have an adverse impact on our reputation, business, financial condition, results of operations and prospects and the value of our common stock.

If another party obtains orphan drug exclusivity for a product that is essentially the same as a product we are developing for a particular indication, we may be precluded or delayed from commercializing the product in that indication.

Under the Orphan Drug Act, the FDA may grant orphan drug designation to drugs intended to treat a rare disease or condition. The company that obtains the first regulatory approval from the FDA for a designated orphan drug for a rare disease generally receives marketing exclusivity for use of that drug for the designated condition for a period of seven years. Similar laws exist in the EU with a term of ten years. See *Business - Government Regulation - Orphan Drugs* in Item 1 of Part I of our 2017 Annual Report for additional information. If a competitor obtains approval of the same drug for the same indication or disease before us, and the FDA grants such orphan drug exclusivity, we would be prohibited from obtaining approval for our product for seven or more years, unless our product can be shown to be clinically superior. In addition, even if we obtain

orphan exclusivity, the FDA may approve another product during our orphan exclusivity period for the same indication under certain circumstances.

Our research, development and manufacturing activities used in the production of ARIKAYCE and our product candidates involve the use of hazardous materials, which could expose us to damages, fines, penalties and sanctions and materially adversely affect our results of operations and financial condition.

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 research and development program and manufacturing activities for ARIKAYCE and our product candidates involve the controlled use of hazardous materials and chemicals. We generally contract with third parties for the disposal of these materials and wastes. Although we strive to comply with all pertinent regulations, the risk of environmental contamination, damage to facilities or injury to personnel from the accidental or improper use or control of these materials remains. In addition to any liability we could have for any misuse by us of hazardous materials and chemicals, we could also potentially be liable for activities of our CMOs or other third parties. Any such liability, or even allegations of such liability, could materially adversely affect our results of operations and financial condition. We also could incur significant costs as a result of civil or criminal fines and penalties.

In addition, we may 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.

Risks Related to Our Financial Condition and Need for Additional Capital

We have a history of operating losses, expect to incur operating losses for the foreseeable future and may never achieve or maintain profitability.

We have incurred losses each previous year of our operation, except in 2009, when we sold our manufacturing facility and certain other assets to Merck, and we did not generate material revenue during the nine months ended September 30, 2018 or the years ended December 31, 2017, 2016 or 2015. As of September 30, 2018, our accumulated deficit was $1.2 billion. For the nine months ended September 30, 2018 and the years ended December 31, 2017 and 2016, our consolidated net loss was $232.7 million, $192.6 million and $176.3 million, respectively. Our ability to generate revenue will depend on the success of commercial sales of ARIKAYCE; however, we do not anticipate our revenue from the sale of ARIKAYCE will be sufficient for us to become profitable without reductions in our operating expenses. Despite our recent launch of ARIKAYCE in the US, we expect to continue to incur substantial operating expenses, and resulting operating losses, for the foreseeable future as we:

- initiate or continue clinical studies of our product candidates;
- initiate a post-marketing clinical trial of ARIKAYCE, as required by the FDA;
- seek to discover or in-license additional product candidates;
- seek regulatory approvals for ARIKAYCE in foreign markets;
- scale-up manufacturing capabilities for future ARIKAYCE production, including the build-out of production capacity at Patheon and process improvements in order to manufacture at a commercial scale; and
- enhance operational, compliance, financial, quality and information management systems and hire more personnel, including personnel to support our commercialization efforts and development of our product candidates.

Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

We may need to raise additional funds to continue our operations, but we face uncertainties with respect to our ability to access capital.

Our operations have consumed substantial amounts of cash since our inception. We expect to expend substantial financial resources to commercialize ARIKAYCE, including expenditures on product sales, marketing, manufacturing and distribution, fund the confirmatory post-marketing study and continue research and development of and, where applicable, seek regulatory approval for ARIKAYCE and our product candidates. We may need to raise additional capital to fund these activities, including due to changes in our product development plans or misjudgment of expected costs, to fund corporate development, to maintain our intellectual property portfolio or to resolve litigation. As of September 30, 2018, we had $567.6 million of cash and cash equivalents on hand. Our operating expenses, capital expenditures and long-term investments have been significantly higher in 2018 than in comparable periods of 2017, reflecting our investment in the build-out of our

commercial organization to support global expansion activities for ARIKAYCE, including the launch of ARIKAYCE in the US in the fourth quarter of 2018, the build-up of third-party manufacturing capacity and manufacture of commercial inventory, which includes capital and long-term investments, and continued investment in research and development as well as general and administrative expenses. We do not know whether additional financing will be available when needed, or, if available, whether the terms will be favorable. If adequate funds are not available to us when needed, we may be forced to delay, restrict or eliminate all or a portion of our development programs or commercialization efforts.

We have outstanding indebtedness in the form of convertible senior notes, and may incur additional indebtedness in the future, which could adversely affect our financial position, prevent us from implementing our strategy, and dilute the ownership interest of our existing shareholders.

In January 2018, we completed an underwritten public offering of 1.75% convertible senior notes due 2025 (the Convertible Notes). The Convertible Notes may be convertible into common stock at an initial conversion rate of 25.5384 shares of common stock per $1,000 principal amount of Convertible Notes. We sold $450.0 million aggregate principal amount of the Convertible Notes, including the exercise in full of the underwriters' option to purchase additional Convertible Notes, resulting in net proceeds of approximately $435.8 million. Holders of the Convertible Notes may convert their Convertible Notes at their option at any time prior to the close of business on the business day immediately preceding October 15, 2024 only under certain circumstances. On or after October 15, 2024 until the close of business on the second scheduled trading day immediately preceding the maturity date, holders may convert their Convertible Notes at any time. Upon conversion of the Convertible Notes, we may deliver cash, shares of our common stock or a combination of cash and shares of our common stock, at our election.

The degree to which we are leveraged could have negative consequences, such as the following:

- we may be more vulnerable to economic downturns, less able to withstand competitive pressures, and less flexible in responding to changing economic conditions;
- our ability to obtain financing in the future may be limited;
- a substantial portion of our cash flows from operations in the future may be required for the payment of the principal amount of the Convertible Notes when they or any additional indebtedness become due;
- we may elect to make cash payments upon conversion of the Convertible Notes, which would reduce our available cash.

Our ability to pay principal or interest on or, if desired, to refinance our indebtedness, including the Convertible Notes, depends on our future performance, which is subject to economic, financial, competitive and other factors, some of which are beyond our control. Our business may not generate cash flow from operations in the future sufficient to satisfy any obligations under the Convertible Notes to make cash payments to noteholders or our obligations under any future indebtedness we may incur. If we are unable to generate such cash flow, we may be required to delay, restrict or eliminate all or a portion of our development programs or commercialization efforts or refinance or obtain additional equity capital on terms that may be onerous or highly dilutive. If we do not meet our debt obligations, it could materially adversely affect our results of operations, financial condition and the value of our common stock.

The conversion of some or all of the Convertible Notes will dilute the ownership interests of our existing shareholders to the extent we deliver shares upon their conversion. Any sales in the public market of the common stock issuable upon such conversion could adversely affect prevailing market prices of our common stock. In addition, the existence of the Convertible Notes may encourage short selling by market participants because the conversion of the Convertible Notes could be used to satisfy short positions, or anticipated conversion of the Convertible Notes into shares of our common stock could depress the price of our common stock.

The accounting method for the Convertible Notes may have an adverse effect on our reported financial results.

Accounting guidance requires that we separately account for the liability and equity components of the Convertible Notes because they may be settled entirely or partially in cash upon conversion in a manner that reflects our economic interest cost. As a result, the equity component of the Convertible Notes is required to be included in the additional paid-in capital section of shareholders' equity on our consolidated balance sheet, and the value of the equity component is treated as original issue discount for purposes of accounting for the debt component of the Convertible Notes. We may report greater net loss (or lower net income) in our financial results because this guidance requires interest to include both the current period's amortization of the debt discount and the instrument's coupon interest, which could adversely affect our reported or future financial results, the market price of our common stock and the trading price of the Convertible Notes.

Holders may convert their Convertible Notes at their option at any time prior to the close of business on the business day immediately preceding October 15, 2024 only under certain circumstances. For example, holders may convert their Convertible Notes at their option during any quarter commencing after the quarter ending March 31, 2018 (and only during such quarter) if the last reported sale price of our 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 quarter is greater than or equal to 130% of the conversion price on each applicable trading day. If the Convertible Notes become convertible prior to October 15, 2024, we may be required to reclassify our Convertible Notes and the related debt issuance costs as current liabilities and certain portions of our equity outside of equity to mezzanine equity, which would have an adverse impact on our reported financial results for such quarter, and could have an adverse impact on the market price of our common stock and the trading price of the Convertible Notes.

Intangible assets comprised approximately 9% of our total assets as of September 30, 2018. A reduction in the value of our intangible assets could have a material adverse effect on our results of operations, financial condition and the value of our common stock.

As a result of the merger with Transave in 2010, we recorded an intangible in-process research and development (IPRD) asset of $77.9 million and goodwill of $6.3 million on our balance sheet. As a result of the clinical hold on ARIKAYCE announced in late 2011, we recorded a charge of $26.0 million in the fourth quarter of 2011 that reduced the value of IPRD to $58.2 million and reduced goodwill to zero. In addition, in September 2018 we recorded an additional $1.7 million in intangible assets related to a milestone due to PARI as a result of FDA approval of ARIKAYCE. Future activities or events could result in additional write-downs of these intangible assets, which could materially adversely affect our results of operations, financial condition and the value of our common stock.

We may be unable to use certain of our net operating losses and other tax assets.

We have substantial tax loss carry forwards for US federal income tax and state income tax purposes, and beginning in 2015, we had tax loss carry forwards in Ireland as well. In general, our net operating losses and tax credits have been fully offset by a valuation allowance due to uncertainties surrounding our ability to realize these tax benefits. In particular, our ability to fully use certain US tax loss carry forwards and general business tax credit carry forwards recorded prior to December 2010 to offset future income or tax liability is limited under section 382 of the Internal Revenue Code of 1986, as amended (the Code). Changes in the ownership of our stock, including those resulting from the issuance of shares of our common stock offerings or upon exercise of outstanding options, may limit or eliminate our ability to use certain net operating losses and tax credit carry forwards in the future.

Risks Related to Ownership of Our Common Stock

The market price of our stock has been and may continue to be highly volatile, which could lead to shareholder litigation against us.

Our common stock is listed on the Nasdaq Global Select Market under the ticker symbol “INSM”. The market price of our stock has been and may continue to be highly volatile and could be subject to wide fluctuations in price in response to various factors, including those discussed herein, many of which are beyond our control. In addition, the stock market has from time to time experienced extreme price and volume fluctuations, which have particularly affected the market prices for emerging biotechnology and pharmaceutical companies like us, and which have often been unrelated to their operating performance.

Historically, when the market price of a stock has been volatile, shareholders are more likely to institute securities and derivative class action litigation against the issuer of such stock. We previously faced a shareholder suit following a decline in our stock price. If any of our shareholders bring a lawsuit against us in the future, it could have a material adverse effect on our business. We have insurance policies related to some of the risks associated with our business, including directors’ and officers’ liability insurance policies; however, our insurance coverage may not be sufficient and our insurance carriers may not cover all claims in a given litigation. If we are not successful in our defense of claims asserted in shareholder litigation, those claims are not covered by insurance or they exceed our insurance coverage, we may have to pay damage awards, indemnify our executive officers, directors and third parties from damage awards that may be entered against them and pay our and their costs and expenses incurred in defense of, or in any settlement of, such claims. In addition, such shareholder suits could divert the time and attention of management from our business.

Certain provisions of Virginia law, our articles of incorporation and amended and restated bylaws and arrangements between us and our employees could hamper a third party’s acquisition of, or discourage a third party from attempting to

acquire control of us.

Certain provisions of Virginia law, our articles of incorporation and amended and restated bylaws and arrangements with our employees could hamper a third party's acquisition of, or discourage a third party from attempting to acquire control of, us or limit the price that investors might be willing to pay for shares of our common stock. These provisions or arrangements include:

- The ability to issue preferred stock with rights senior to those of our common stock without any further vote or action by the holders of our common stock. The issuance of preferred stock could decrease the amount of earnings and assets available for distribution to the holders of our common stock or could adversely affect the rights and powers, including voting rights, of the holders of our common stock. In certain circumstances, such issuance could have the effect of decreasing the market price of our common stock.
- The existence of a staggered board of directors in which there are three classes of directors serving staggered three-year terms, thus expanding the time required to change the composition of a majority of directors.
- The requirement that shareholders provide advance notice when nominating director candidates to serve on our Board of Directors.
- The inability of shareholders to convene a shareholders' meeting without the chairman of the board, the president or a majority of the board of directors first calling the meeting.
- The prohibition against entering into a business combination with the beneficial owner of 10% or more of our outstanding voting stock for a period of three years after the 10% or greater owner first reached that level of stock ownership, unless certain criteria are met.
- In addition to severance agreements with our officers and provisions in our incentive plans that permit acceleration of equity awards upon a change in control, a severance plan for eligible full-time employees that provides such employees with severance equal to six months of their then-current base salaries in connection with a termination of employment without cause upon, or within 18 months following, a change in control.

We previously had a shareholder rights plan, or "poison pill," which expired in May 2011. Under Virginia law, our Board of Directors may implement a new shareholders' rights plan without shareholder approval. Our Board of Directors intends to regularly consider this matter, even in the absence of specific circumstances or takeover proposals, to facilitate its future ability to quickly and effectively protect shareholder value.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

There were no unregistered sales of the Company's equity securities by the Company during the quarter ended September 30, 2018.

ITEM 6. EXHIBITS

Exhibit Index

3.1	Articles of Incorporation of Insmed Incorporated, as amended through June 14, 2012 (incorporated by reference from Exhibit 3.1 to Insmed Incorporated's Annual Report on Form 10-K filed on March 18, 2013) (File No. 000-30739).
3.2	Amended and Restated Bylaws of Insmed Incorporated (incorporated by reference from Exhibit 3.1 to Insmed Incorporated's Quarterly Report on Form 10-Q filed on August 6, 2015).
10.1	Lease Agreement, dated September 11, 2018, by and between Insmed Incorporated and Exeter 700 Route 202/206, LLC (incorporated by reference from Exhibit 10.1 to Insmed Incorporated's Current Report on Form 8-K filed on September 17, 2018).
31.1	Certification of William H. Lewis, Chief Executive Officer of Insmed Incorporated, pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes Oxley Act of 2002.
31.2	Certification of Paolo Tombesi, Chief Financial Officer (Principal Financial and Accounting Officer) of Insmed Incorporated, pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes Oxley Act of 2002.
32.1	Certification of William H. Lewis, Chief Executive Officer of Insmed Incorporated, 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 Paolo Tombesi, Chief Financial Officer (Principal Financial and Accounting Officer) of Insmed Incorporated, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes Oxley Act of 2002.
101	The following materials from Insmed Incorporated's quarterly report on Form 10-Q for the quarter ended September 30, 2018 formatted in XBRL (eXtensible Business Reporting Language): (i) Consolidated Balance Sheets as of September 30, 2018 and December 31, 2017, (ii) Consolidated Statements of Comprehensive Loss for the three and nine months ended September 30, 2018 and 2017, (iii) Consolidated Statements of Cash Flows for the nine months ended September 30, 2018 and 2017, and (iv) Notes to the Unaudited Consolidated Financial Statements.

SIGNATURE

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.

INSMED INCORPORATED

Date: October 30, 2018

By /s/ Paolo Tombesi

Paolo Tombesi
Chief Financial Officer
(Principal Financial and Accounting Officer)

EXHIBIT 31.1

Section 302 Certification

I, William H. Lewis, Chief Executive Officer of Insmed Incorporated, certify that:

(1) I have reviewed this Quarterly Report on Form 10-Q of Insmed Incorporated;

(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 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: October 30, 2018

/s/ William H. Lewis

William H. Lewis
Chief Executive Officer
(Principal Executive Officer)

EXHIBIT 31.2

Section 302 Certification

I, Paolo Tombesi, Chief Financial Officer (Principal Financial and Accounting Officer) of Insmed Incorporated, certify that:

(1) I have reviewed this Quarterly Report on Form 10-Q of Insmed Incorporated;

(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 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: October 30, 2018

/s/ Paolo Tombesi

Paolo Tombesi
Chief Financial Officer
(Principal Financial and Accounting 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 2003

Solely for the purposes of complying with 18 U.S.C. § 1350, I, William Lewis, Chief Executive Officer of Insmed Incorporated (the "Company"), hereby certify, based on my knowledge, that:

(1) the Quarterly Report on Form 10-Q of the Company for the quarter ended September 30, 2018 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

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

/s/ William H. Lewis
William H. Lewis
Chief Executive Officer
(Principal Executive Officer)

October 30, 2018

This certification accompanies the Quarterly Report on Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Insmed Incorporated under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-Q), irrespective of any general incorporation language contained in such filing. A signed original of this statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2003

Solely for the purposes of complying with 18 U.S.C. § 1350, I, Paolo Tombesi, Chief Financial Officer (Principal Financial and Accounting Officer) of Insmed Incorporated (the "Company"), hereby certify, based on my knowledge, that:

(1) the Quarterly Report on Form 10-Q of the Company for the quarter ended September 30, 2018 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

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

/s/ Paolo Tombesi

Paolo Tombesi
Chief Financial Officer
(Principal Financial and Accounting Officer)

October 30, 2018

This certification accompanies the Quarterly Report on Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Insmed Incorporated under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-Q), irrespective of any general incorporation language contained in such filing. A signed original of this statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.