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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: 001-37539

Global Blood Therapeutics, Inc.
(Exact name of registrant as specified in its charter)

Delaware **(State or other jurisdiction of incorporation or organization)**	**27-4825712** **(I.R.S. Employer Identification No.)**

171 Oyster Point Boulevard, Suite 300
South San Francisco, CA 94080
(Address of principal executive offices)

(650) 741-7700
(Registrant's telephone number, including area code)

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

Indicate by check mark whether the registrant has submitted electronically 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, 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. (Check one):

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

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

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. ☐

As of November 1, 2018, there were 52,232,448 shares of the registrant's Common Stock, par value $0.001 per share, outstanding.

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PART I. – FINANCIAL INFORMATION

Item 1. Financial Statements

GLOBAL BLOOD THERAPEUTICS, INC.
Condensed Consolidated Balance Sheets
(In thousands, except share and per share amounts)

	September 30, 2018 (Unaudited)	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$ 194,891	$ 198,332
Short-term marketable securities	188,337	116,493
Prepaid expenses and other current assets	8,951	9,487
Total current assets	392,179	324,312
Property and equipment, net	16,749	16,571
Long-term marketable securities	98,869	14,607
Restricted cash	2,395	1,046
Other assets, noncurrent	219	184
Total assets	$ 510,411	$ 356,720
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 4,960	$ 7,177
Accrued liabilities	13,844	10,135
Accrued compensation	7,179	8,579
Other liabilities, current	944	373
Total current liabilities	26,927	26,264
Other liabilities, noncurrent	11,283	11,652
Total liabilities	38,210	37,916
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.001 par value, 5,000,000 shares authorized as of September 30, 2018 and December 31, 2017; no shares issued and outstanding	—	—
Common stock, $0.001 par value, 150,000,000 shares authorized as of September 30, 2018 (unaudited) and December 31, 2017, respectively; 52,120,387 and 46,131,723 shares issued and outstanding as of September 30, 2018 (unaudited) and December 31, 2017, respectively	52	46
Additional paid-in capital	895,478	617,051
Accumulated other comprehensive loss	(381)	(336)
Accumulated deficit	(422,948)	(297,957)
Total stockholders' equity	472,201	318,804
Total liabilities and stockholders' equity	$ 510,411	$ 356,720

See accompanying notes to unaudited condensed consolidated financial statements.

GLOBAL BLOOD THERAPEUTICS, INC.
Condensed Consolidated Statements of Operations and Comprehensive Loss
(Unaudited)
(In thousands, except share and per share amounts)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Operating expenses:				
Research and development	$ 33,026	$ 20,952	$ 94,543	$ 56,513
General and administrative	12,450	8,228	36,115	20,817
Total operating expenses	45,476	29,180	130,658	77,330
Loss from operations	(45,476)	(29,180)	(130,658)	(77,330)
Other income (expense):				
Interest income, net	2,480	727	5,768	1,856
Other expenses, net	(72)	(104)	(101)	(298)
Total other income, net	2,408	623	5,667	1,558
Net loss	(43,068)	(28,557)	(124,991)	(75,772)
Other comprehensive loss:				
Net unrealized gain (loss) on marketable securities, net of tax	(139)	71	(45)	(31)
Comprehensive loss	$ (43,207)	$ (28,486)	$ (125,036)	$ (75,803)
Basic and diluted net loss per common share	$ (0.83)	$ (0.66)	$ (2.47)	$ (1.81)
Weighted-average number of shares used in computing basic and diluted net loss per common share	52,050,232	43,259,145	50,536,860	41,832,273

See accompanying notes to unaudited condensed consolidated financial statements.

GLOBAL BLOOD THERAPEUTICS, INC.
Condensed Consolidated Statements of Cash Flows
(Unaudited)
(In thousands)

	Nine Months Ended September 30,	
	2018	2017
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (124,991)	$ (75,772)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	2,509	1,008
Amortization (accretion) of premium (discount) on marketable securities	(226)	561
Stock-based compensation	22,552	8,941
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(4,496)	(2,873)
Accounts payable	(2,131)	(939)
Accrued liabilities	5,882	900
Accrued compensation	(1,400)	554
Other liabilities	499	(45)
Net cash used in operating activities	(101,802)	(67,665)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchase of property and equipment	(4,946)	(1,773)
Purchase of marketable securities	(259,631)	(127,721)
Maturities of marketable securities	108,707	52,109
Net cash used in investing activities	(155,870)	(77,385)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock in public offering, net	255,119	135,625
Proceeds from issuance of common stock in settlement of employee stock purchase plan and exercise of stock options	6,722	3,066
Repurchases of unvested restricted stock	(8)	(421)
Tax paid related to net shares settlement of equity awards	(6,253)	(237)
Net cash provided by financing activities	255,580	138,033
Net decrease in cash, cash equivalents and restricted cash	(2,092)	(7,017)
Cash, cash equivalents and restricted cash at beginning of period	199,378	92,212
Cash, cash equivalents and restricted cash at end of period	$ 197,286	$ 85,195
SUPPLEMENTAL DISCLOSURES OF NON-CASH INVESTING AND FINANCING INFORMATION:		
Accrued purchase of property and equipment	$ (2,173)	$ 98
Leasehold improvements paid for by landlord	$ —	$ 9,885

See accompanying notes to unaudited condensed consolidated financial statements.

GLOBAL BLOOD THERAPEUTICS, INC.
Notes to Unaudited Condensed Consolidated Financial Statements

1. Organization and Basis of Presentation

Global Blood Therapeutics, Inc. (the “Company”, “we”, “us”, and “our”) was incorporated in Delaware in February 2011 and commenced operations in May 2012. We are a clinical-stage biopharmaceutical company determined to discover, develop and deliver innovative treatments that provide hope to underserved patient communities. Our primary activities have been establishing our facilities, recruiting personnel, conducting development of our product candidates, including clinical trials, and raising capital. Our principal operations are based in South San Francisco, California, and we operate in one segment.

Follow-on Offerings

In December 2017, we completed a follow-on offering and issued 2,631,579 shares of common stock at a price of $38.00 per share with proceeds of $96.4 million net of underwriting costs and commissions, and offering expenses. In addition, in January 2018, we sold an additional 394,736 shares of our common stock directly to the underwriters when they exercised their over-allotment option at the price of $38.00 per share for proceeds of $14.6 million net of underwriting costs and commissions.

In March 2018, we completed a follow-on offering and issued an aggregate of 4,600,000 shares of our common stock at a price of $54.00 per share, including 600,000 shares of our common stock sold directly to the underwriters when they exercised their over-allotment option at the price of $54.00 per share. We received total proceeds of $240.6 million from the offering, net of underwriting discounts and commissions, and offering expenses.

Need for Additional Capital

In the course of our development activities, we have sustained operating losses and we expect such losses to continue over the next several years. Our ultimate success depends on the outcome of our research and development activities. Since inception through September 30, 2018, we have incurred cumulative net losses of $422.9 million. We expect to incur additional losses in the future to conduct product research and development and we recognize the need to raise additional capital to fully implement our business plan. We intend to raise such capital through the issuance of additional equity, and potentially through borrowings, and strategic alliances with partner companies. However, if such financing is not available at adequate levels, we will need to re-evaluate our operating plans. We believe that our existing cash and cash equivalents and marketable securities will be sufficient to fund our cash requirements for at least twelve months subsequent to the issuance of these financial statements.

2. Summary of Significant Accounting Policies

Basis of Preparation

The accompanying unaudited interim condensed consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“U.S. GAAP”) and applicable rules and regulations of the Securities and Exchange Commission (“SEC”) regarding interim financial reporting. As permitted under those rules, certain footnotes or other financial information that are normally required by U.S. GAAP have been condensed or omitted, and accordingly the balance sheet as of December 31, 2017 has been derived from audited consolidated financial statements at that date but does not include all of the information required by U.S. GAAP for complete financial statements. These unaudited interim condensed consolidated financial statements have been prepared on the same basis as our annual consolidated financial statements and, in the opinion of management, reflect all adjustments (consisting only of normal recurring adjustments) that are necessary for a fair presentation of our financial information. The results of operations for the three and nine months ended September 30, 2018 are not necessarily indicative of the results to be expected for the year ending December 31, 2018 or for any other interim period or for any other future year.

The accompanying unaudited interim condensed consolidated financial statements and related financial information should be read in conjunction with the audited financial statements and the related notes thereto for the year ended December 31, 2017 included in our Annual Report on Form 10-K, filed with the SEC on February 27, 2018.

Use of Estimates

The preparation of the accompanying unaudited interim condensed consolidated financial statements in accordance with U.S. GAAP requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the condensed consolidated financial statements, and the reported amounts of costs and expenses during the reporting period. We base our estimates and assumptions on historical experience when available and on various factors that we believe to be reasonable under the circumstances. We evaluate our estimates and assumptions on an ongoing basis. Our actual results could differ from these estimates under different assumptions or conditions.

Principles of Consolidation

The accompanying unaudited interim condensed consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All intercompany transactions and balances have been eliminated upon consolidation.

Significant Accounting Policies

There have been no material revisions in our significant accounting policies described in Note 2 to the consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2017.

Accounting Pronouncements Adopted

In August 2016, the FASB issued ASU No. 2016-15, *Classification of Certain Cash Receipts and Cash Payments*. The new standard provides guidance on eight specific cash flow classification issues. The standard is effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. We adopted ASU No. 2016-15 in the first quarter of 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Restricted Cash*. The new standard requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The standard is effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. We adopted ASU No. 2016-18 in the first quarter of 2018 using a retrospective transition method to each period presented. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation – Stock Compensation (Topic 718)*, which is intended to clarify and reduce the diversity in practice and cost and complexity when applying the guidance in Topic 718, Compensation – Stock Compensation, to a change to the terms or conditions of a share-based payment award. The new standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017. We adopted ASU No. 2017-09 in the first quarter of 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-04, *Investments – Debt Securities (Topic 320) and Regulated Operations (Topic 980): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 117 and SEC Release No. 33-9273*. The amendment of ASU No. 2018-04 adds, amends and supersedes various paragraphs that contain SEC guidance in ASC 320, *Investments-Debt Securities* and ASC 980, *Regulated Operations*. The amendments in this update were effective upon issuance in March 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-05, *Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118*. The amendment of ASU No. 2018-05 adds various paragraphs that contain SEC guidance in ASC 740, *Income Taxes* and SEC Staff Accounting Bulletin No. 118. The amendments in this update were effective upon issuance in March 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation – Stock Compensation (Topic 718), Improvements to Nonemployee Share-Based Payment Accounting*, which is intended to improve the usefulness of the information provided to the users of financial statements while reducing cost and complexity in financial reporting. Under the new standard, nonemployee share-based payment awards within the scope of Topic 718 are measured at grant-date fair value of the equity instruments that an entity is obligated to issue when conditions necessary to earn the right to benefit from the instruments have been satisfied. These equity-classified non-employee share-based payment awards are measured at the grant date. Consistent with the accounting for employee share-based payment awards, an entity considers the probability of satisfying performance conditions when nonemployee share-based payment awards contain such conditions. The new standard also eliminates the requirement to reassess classification of such awards upon vesting. The new standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2018. Early adoption is permitted, but no earlier than an entity’s adoption date of Topic 606. We early adopted ASU No. 2018-07 effective January 1, 2018. The early adoption of this new standard did not have a material impact on our consolidated financial statements.

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)* (or ASU 2016-02). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less will be accounted for similar to existing guidance for operating leases. The standard is effective for interim and annual periods beginning after December 15, 2018, with early adoption permitted. During 2018, the FASB issued ASU No. 2018-01, *Land Easement Practical Expedient for Transition to Topic 842*, ASU No. 2018-10, *Codification Improvements to Topic 842, Leases*, and ASU No. 2018-11, *Leases (Topic 842) – Targeted Improvements*, which provided an entity the modified retrospective transition approach to initially account for the impact of the adoption with a cumulative adjustment to accumulated deficit on the effective date of the ASU 2016-02, January 1, 2019 rather than January 1, 2017, which would eliminate the need to restate amounts presented prior to January 1, 2019. We plan to adopt the standard on January 1, 2019 and to elect the modified retrospective transition method for adoption as described above. The new standard also provides a number of optional practical expedients that allow entities to not (i) reassess whether any expired or existing contracts are considered or contain leases; (ii) reassess the lease classification for any expired or existing leases; and (iii) reassess initial direct costs for any existing leases. We plan to elect the use of practical expedients. We expect that this standard will have a material effect on our consolidated financial statements. While we continue to evaluate the provisions of ASC 842 to determine the impact the adoption will have on our consolidated financial statements, we currently believe the most significant effects relate to the recognition of new right-of-use assets and lease liabilities on our consolidated balance sheet. We do not expect a significant change in our leasing activities between now and adoption.

In February 2018, the FASB issued ASU No. 2018-02, *Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*. The amendment of ASU No. 2018-02 states an entity may elect to reclassify the income tax effects of the Tax Cuts and Jobs Act of 2017 (the “Tax Cuts and Jobs Act”) on items within accumulated other comprehensive income to retained earnings. The amendments in this update are effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2018. Early adoption is permitted. We believe that the adoption of this new standard will have no material impact on our consolidated financial position or results of operations and have not elected to early adopt the amendment.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820)*. The new standard modifies the disclosure requirements on fair value measurements in Topic 820, Fair Value Measurement, including removals of, modification to, and additional disclosure requirements from Topic 820. The amendment of ASU No. 2018-13 removes disclosure requirements from Topic 820 in the areas of (1) the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy; (2) the policy for timing of transfers between levels, and (3) the valuation processes for Level 3 fair value measurements. The amendments in this update are effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Except for certain amendments related to Level 3 fair value measurements, all the other amendments should be applied retrospectively to all periods presented upon their effective date. Early adoption is permitted upon issuance of the ASU No. 2018-13. We believe that the adoption of this new standard will have no material impact on our consolidated financial position or results of operations and have not elected to early adopt the amendment.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40), Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* (or ASU 2018-15). The amendments in ASU 2018-15 align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by the amendments in ASU 2018-15. Accordingly, the amendment of ASU No. 2018-15 requires an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. The amendment in ASU 2018-15 also requires the entity (customer) to expense the capitalized implementation cost of a hosting arrangement that is a service contract over the term of the hosting arrangement. The amendment in ASU 2018-15 further requires the entity to present the expense related to the capitalized implementation costs in the same line item in the statement of income as the fees associated with the hosting element (service) of the arrangement and classify payment for capitalized implementation costs in the statement of cash flows in the same manner as payments made for fees associated with the hosting element. The entity is also required to present the capitalized implementation costs in the statement of financial position in the same line item that a prepayment for the fees of the associated hosting arrangement would be presented. The amendments in this update are effective for annual reporting periods beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption of the amendments in this update is permitted, including adoption in any interim period for all entities. The amendments in this update should be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. We believe that the adoption of this new standard will have no material impact on our consolidated financial position or results of operations and have not elected to early adopt the amendment.

3. Fair Value Measurements

Fair value accounting is applied for all financial assets and liabilities that are recognized or disclosed at fair value in the consolidated financial statements on a recurring basis (at least annually). Our financial instruments consist of cash and cash equivalents, marketable securities, other receivables as included in prepaid expenses and other current assets, restricted cash, accounts payable and accrued liabilities. Cash and cash equivalents, marketable securities and restricted cash are reported at their respective fair values on our condensed consolidated balance sheets. The remaining financial instruments are reported on our condensed consolidated balance sheets at cost that approximate current fair values due to their relatively short maturities.

Assets and liabilities recorded at fair value on a recurring basis in the condensed consolidated balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Fair value is defined as the exchange price that would be received for an asset or an exit price that would be paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The authoritative guidance on fair value measurements establishes a three-tier fair value hierarchy for disclosure of fair value measurements as follows:

Level 1 – Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date;

Level 2 – Inputs are observable, unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3 – Unobservable inputs that are significant to the measurement of the fair value of the assets or liabilities that are supported by little or no market data.

The following table summarizes our financial assets measured at fair value on a recurring basis (in thousands):

	September 30, 2018			
	Total	Level 1	Level 2	Level 3
Financial Assets:				
Money market funds	$187,825	$187,825	$ —	$ —
Corporate debt securities	81,082	—	81,082	—
U.S. government agency securities	88,368	—	88,368	—
Certificates of deposits	5,215	—	5,215	—
U.S. government securities	114,259	—	114,259	—
Total financial assets	$476,749	$187,825	$288,924	$ —

	December 31, 2017			
	Total	Level 1	Level 2	Level 3
Financial Assets:				
Money market funds	$134,744	$134,744	$ —	$ —
Corporate debt securities	46,977	—	46,977	—
U.S. government agency securities	54,989	—	54,989	—
Certificates of deposits	9,129	—	9,129	—
U.S. government securities	20,007	—	20,007	—
Total financial assets	$265,846	$134,744	$131,102	$ —

We estimate the fair values of our investments in corporate debt securities, government and government related securities and certificates of deposits by taking into consideration valuations obtained from third-party pricing services. The fair value of our marketable securities classified within Level 2 is based upon observable inputs that may include benchmark yields, reported trades, broker/dealer quotes, issuer spreads, two-sided markets, benchmark securities, bids, offers and reference data including market research publications. At September 30, 2018 and December 31, 2017, the weighted average remaining contractual maturities of our Level 2 investments was less than one year and all of these investments are rated A-1/P-1/F1 or A/A2, or higher by Moody's, S&P and Fitch. There were no transfers between Level 1 and Level 2 during the periods presented.

4. Available-for-Sale Securities

Estimated fair values of available-for-sale securities are generally based on prices obtained from commercial pricing services. The following table is a summary of available-for-sale securities recorded in cash and cash equivalents, restricted cash, or marketable securities in our condensed consolidated balance sheets (in thousands):

	September 30, 2018				December 31, 2017			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value
Financial Assets:								
Money market funds	$187,825	$ —	$ —	$ 187,825	$134,744	$ —	$ —	$ 134,744
Corporate debt securities	81,213	—	(131)	81,082	47,108	—	(131)	46,977
U.S. government agency securities	88,495	—	(127)	88,368	55,170	—	(181)	54,989
Certificates of deposits	5,216	1	(2)	5,215	9,142	—	(13)	9,129
U.S. government securities	114,381	—	(122)	114,259	20,018	—	(11)	20,007
Total	$477,130	$ 1	$ (382)	$ 476,749	$266,182	$ —	$ (336)	$ 265,846

The following table summarizes the classification of the available-for-sale securities on our condensed consolidated balance sheets (in thousands):

	September 30, 2018	December 31, 2017
Cash and cash equivalents	$ 189,543	$ 134,746
Short-term marketable securities	188,337	116,493
Long-term marketable securities	98,869	14,607
Total	$ 476,749	$ 265,846

We do not intend to sell the investments that are in an unrealized loss position, and it is unlikely that we will be required to sell the investments before recovery of their amortized cost basis, which may be maturity. We have determined that the gross unrealized losses on our marketable securities were temporary in nature during the periods presented.

5. Balance Sheet Components

Property and Equipment

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

	September 30, 2018	December 31, 2017
Laboratory equipment	$ 6,766	$ 5,715
Computer equipment	1,630	1,594
Leasehold improvements	13,730	12,642
Construction-in-progress	932	419
Total property and equipment	23,058	20,370
Less: accumulated depreciation and amortization	(6,309)	(3,799)
Property and equipment, net	$ 16,749	$ 16,571

Accrued liabilities

Accrued liabilities consist of the following (in thousands):

	September 30, 2018	December 31, 2017
Accrued clinical and manufacturing expenses	$ 13,024	$ 8,035
Accrued professional and consulting services	652	1,007
Other	168	1,093
Total accrued liabilities	$ 13,844	$ 10,135

Other liabilities, current and noncurrent

Other liabilities consist of the following (in thousands):

	September 30, 2018	December 31, 2017
Restricted shares subject to repurchase, current	$ 237	$ 373
Deferred rent, current	677	—
Other payable	30	—
Total other liabilities, current	$ 944	$ 373
Restricted shares subject to repurchase, noncurrent	$ —	$ 161
Deferred rent, noncurrent	11,223	11,491
Other liabilities, noncurrent	60	—
Total other liabilities, noncurrent	$ 11,283	$ 11,652

6. Stock Based Compensation

We have three stock-based compensation plans – the Amended and Restated 2017 Inducement Equity Plan (the “2017 Inducement Plan”), the 2015 Stock Option and Incentive Plan (the “2015 Plan”) and the 2012 Stock Option and Grant Plan (the “2012 Plan”). As of September 30, 2018, there were 646,600 shares reserved under the 2017 Inducement Plan and 2,543,178 shares reserved under the 2015 Plan for the future issuance of equity awards. Upon adoption of the 2015 Plan in July 2015, no new awards or grants are permitted under the 2012 Plan. See Note 7 to the Consolidated Financial Statements included in our Annual Report on Form 10-K for the year ended December 31, 2017 for additional information related to these stock-based compensation plans.

Stock Options

The following summarizes option activity under the 2017 Inducement Plan, 2015 Plan and 2012 Plan:

	Number of Options	Weighted-Average Exercise Price
Outstanding — December 31, 2017	2,945,901	$ 17.50
Options granted	928,958	55.74
Options exercised	(527,278)	9.63
Options canceled	(147,052)	33.74
Outstanding — September 30, 2018	3,200,529	$ 29.15

The fair values of stock options granted to employees were calculated using the following assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Expected term (in years)	6.1	6.0-6.1	5.3-6.1	5.3-6.1
Volatility	69.7%-70.3%	72.0%-73.1%	68.7%-70.8%	70.9%-75.6%
Risk-free interest rate	2.8%-2.9%	1.9%-2.1%	2.6%-2.9%	1.8%-2.3%
Dividend yield	—	—	—	—

Restricted Stock Units

The following table summarizes activity of RSUs granted to employees with service-based vesting under the 2017 Inducement Plan and 2015 Plan and related information:

	Number of RSUs	Weighted-Average Grant Date Fair Value
Non-vested units — December 31, 2017	467,463	$ 24.93
RSUs granted	529,985	57.68
RSUs vested	(162,301)	34.36
RSUs forfeited	(68,153)	41.12
Non-vested units — September 30, 2018	766,994	$ 43.98

Market-Condition Awards Granted to Employees

On August 11, 2017, our Board of Directors approved awards of up to an aggregate of 365,250 RSUs to certain of our senior management team under the 2015 Plan, the vesting of which are contingent upon a combination of continued employment and achieving certain market capitalization milestones. The market-condition awards do not vest until the achievement of their respective market capitalization milestones, which must occur on or before December 31, 2019. The grant date fair value of these market-condition awards was estimated using a Monte Carlo simulation model. The derived service periods, which are the estimated periods of time that would be required to satisfy the market conditions, are also determined at the grant date. We record expense on a straight-line basis over the applicable derived service periods.

During the nine-month period ended September 30, 2018, certain market capitalization milestones were achieved, resulting in vesting of related market-condition RSUs. For the nine-month period ended September 30, 2018, we recognized $2.9 million in stock-based compensation expense related to the market-condition awards (allocated as $0.2 million for research and development expense and $2.7 million for general and administrative expense). The following table summarizes activity of the market-condition awards under the 2015 Plan and related information:

	Number of units	Weighted-Average Grant Date Fair Value
Non-vested market-condition awards — December 31, 2017	353,250	$ 15.15
Granted	—	—
Vested	(188,400)	18.22
Forfeited	(5,600)	11.64
Non-vested market-condition awards — September 30, 2018	159,250	$ 11.64

Employee Stock Purchase Plan

In July 2015, we adopted the 2015 Employee Stock Purchase Plan (the “2015 ESPP”). Under the 2015 ESPP our employees may purchase common stock through payroll deductions at a price equal to 85% of the lower of the fair market value of the stock at the beginning of the offering period or at the end of each applicable purchase period. As approved by the Compensation Committee of the Board of Directors in December 2017, the 2015 ESPP provides for offering periods of two years in duration with purchase periods occurring every six months during an offering period. Contributions under the 2015 ESPP are limited to a maximum of 15% of an employee’s eligible compensation. ESPP purchases are settled with common stock from the ESPP’s previously authorized and available pool of shares.

The fair values of the rights granted under the 2015 ESPP were calculated using the following assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Expected term (in years)	0.5 – 2.0	0.5	0.5 – 2.0	0.5
Volatility	59.2%-65.4%	60.1%-63.5%	59.2%-66.8%	60.1%-63.5%
Risk-free interest rate	1.6%-2.7%	0.7%-1.2%	1.6%-2.7%	0.7%-1.2%
Dividend yield	—	—	—	—

Stock-Based Compensation Expense

Total stock-based compensation recognized by function was as follows (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Research and development	$ 2,835	$ 1,564	$ 9,587	$4,077
General and administrative	4,133	2,143	12,965	4,864
Total stock-based compensation expense	$ 6,968	$ 3,707	$22,552	$8,941

7. Net Loss per Share

Basic net loss per share is computed by dividing net loss by the weighted-average number of common shares outstanding for the period. Since we were in a loss position for all periods presented, diluted net loss per share is the same as basic net loss per share for all periods as the inclusion of all potential common shares outstanding would have been anti-dilutive.

The following securities were not included in the diluted net loss per share calculations because their effect was anti-dilutive:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
Options to purchase common stock	3,200,529	2,889,431	3,200,529	2,889,431
Restricted stock subject to future vesting	71,246	315,542	71,246	315,542
Restricted stock units	926,244	769,783	926,244	769,783
Total	4,198,019	3,974,756	4,198,019	3,974,756

8. Commitments and Contingencies

Facilities

In March 2017, we entered into a noncancelable operating lease (the “Lease”) for approximately 67,185 square feet of space in South San Francisco, California (the “Existing Premises”). The date on which we became responsible for paying rent under the Lease was December 15, 2017 (the “Rent Commencement Date”). The Lease expires 10 years after the Rent Commencement Date. The Lease grants us an option to extend the Lease for an additional 10-year period. Future minimum rental payments under the Lease during the 10-year term are $48.3 million in the aggregate. The Lease further provides that we are obligated to pay to the landlord certain costs, including taxes and operating expenses. The Lease term commenced in November 2017 as we gained control over physical access to the Existing Premises. We have acquired $11.1 million of leasehold improvements at our Existing Premises with the tenant inducement allowance provided under the Lease. We are required to repay $1.7 million of the tenant inducement allowance to the landlord in the form of additional monthly rent with interest applied over the term of the Lease.

In August 2018, we entered into an amendment to the Lease (the “Lease Amendment”) to relocate the leased premises from the Existing Premises to a to-be-constructed-building consisting of approximately 164,150 rentable square feet of space (the “Substitute Premises”) when the Substitute Premises are ready for occupancy (the “Substitute Premises Commencement Date”). The Lease Amendment has a contractual term (the “Substitute Premises Term”) of 10 years from the Substitute Premises Commencement Date. The Lease Amendment grants us an option to extend the Lease for an additional 10-year period. Future minimum rental payments under the Lease Amendment during the 10-year term are $121.5 million in the aggregate. Under the Lease Amendment, we are obligated to pay to the landlord certain costs, including taxes and operating expenses. The Lease Amendment also provides a tenant inducement allowance of up to $27.9 million, of which $4.1 million, if utilized, would be repaid to the landlord in the form of additional monthly rent with interest applied.

In March 2017, we provided a standby letter of credit of $0.9 million as security for our obligations under the Lease on our Existing Premises. The security deposit was increased to $2.4 million under the Lease Amendment. This standby letter of credit is classified as restricted cash.

We intend to vacate the Existing Premises and surrender and deliver the Existing Premises to landlord on or before the date which is sixty days after the Substitute Premises Commencement Date, upon which time we will have no further obligations with respect to the Existing Premises. Upon signing of the Lease Amendment, we re-evaluated the remaining useful life of the leasehold improvements at our Existing Premises and started to amortize the leasehold improvements over the remaining period of expected use, resulting in an acceleration of depreciation expenses which was insignificant during the period ended September 30, 2018.

Future annual minimum lease payments due under the Lease and Lease Amendment at December 31 of each year are as follows (in thousands):

Year ending December 31,	Amount[1]
2018 (three months)	$ 1,076
2019	4,406
2020	6,513
2021	11,642
2022	12,020
Thereafter	102,776
Total	$138,433

(1) *The table above is prepared under the assumption that the Substitute Premises Commencement at the Substitute Premises starts on June 30, 2020.*

Rent expense for the three months ended September 30, 2018 and 2017 was $0.9 million and $0.4 million, respectively, and for the nine months ended September 30, 2018 and 2017 was $2.7 million and $1.1 million, respectively. The operating leases require us to share in prorated operating expenses and property taxes based upon actual amounts incurred; those amounts are not fixed for future periods and, therefore, are not included in the future commitments listed above.

Contingencies

In the ordinary course of business, we may be subject to legal claims and regulatory actions that could have a material adverse effect on our business or financial position. We assess our potential liability in such situations by analyzing potential outcomes, assuming various litigation, regulatory and settlement strategies. If we determine a loss is probable and its amount can be reasonably estimated, we accrue an amount equal to the estimated loss.

No losses and no provision for a loss contingency have been recorded to date.

Contingent Payments

In August 2018, we entered into a license agreement (the “License Agreement”) with F. Hoffmann-La Roche Ltd. and Hoffmann-La Roche Inc. (together, “Roche”) pursuant to which Roche granted us an exclusive and sublicensable worldwide license under certain patent rights and know-how to develop and commercialize inclacumab for all indications and uses, except diagnostic use. Roche retained a non-exclusive, worldwide, perpetual, royalty-free license to inclacumab solely for any diagnostic use. As of September 30, 2018, we have paid Roche an upfront payment of $2.0 million. We are obligated to make contingent payments to Roche totaling approximately $125.5 million upon achievement of certain clinical development and regulatory milestones for inclacumab and commercial sales milestones if they occur before certain dates in the future. We are also obligated to make royalty payments to Roche based on tiered percentages ranging from low double-digit for the first annual net sales of inclacumab tier up to mid double-digit for annual net sales over $1.0 billion.

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

You should read the following discussion and analysis of our financial condition and results of operations in conjunction with our unaudited condensed consolidated financial statements and related notes included in Part I, Item 1 of this Quarterly Report on Form 10-Q and with our audited consolidated financial statements and related notes thereto for the year ended December 31, 2017, included in our Annual Report on Form 10-K filed with the Securities and Exchange Commission on February 27, 2018, or our Annual Report.

This discussion and other parts of this Quarterly Report on Form 10-Q contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended, that involve risks and uncertainties, such as statements of our plans, objectives, expectations and intentions. In some cases you can identify forward-looking statements by terms such as "may," "will," "expect," "anticipate," "estimate," "intend," "plan," "predict," "potential," "believe," "should" and similar expressions. Our actual results could differ materially from those discussed in these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the section of this Quarterly Report on Form 10-Q titled "Risk Factors." We caution readers not to place undue reliance on any forward-looking statements made by us, which speak only as of the date they are made. Except as may be required by law, we assume no obligation to update these forward-looking statements or the reasons that results could differ from these forward-looking statements.

Overview

We are a clinical-stage biopharmaceutical company determined to discover, develop and deliver innovative treatments that provide hope to underserved patient communities. Our lead product candidate is voxelotor (previously known as GBT440), an oral, once-daily therapy that modulates hemoglobin's affinity for oxygen, which we believe inhibits hemoglobin polymerization in sickle cell disease, or SCD.

We are currently evaluating voxelotor in adult and adolescent patients with SCD in a Phase 3 clinical trial, which we call the HOPE Study. In June 2018, we completed a planned review of Part A of the HOPE Study. On the primary endpoint (the proportion of patients with greater than 1 g/dL increase in hemoglobin versus baseline), a statistically significant increase was demonstrated with voxelotor at both the 1500 mg and 900 mg doses after 12 weeks of treatment versus placebo. Based upon the primary endpoint results, we believe voxeletor meets the standard for potential accelerated approval under Subpart H, and we are in discussions with the FDA regarding the potential for such approval including design of required post-marketing confirmatory studies, but we cannot be assured that the FDA will agree with this approach. The FDA grants accelerated approval under Subpart H for new drugs that address serious or life-threatening illnesses and that provide meaningful therapeutic benefit to patients over existing treatments. Accelerated approval under Subpart H does not ensure faster development timelines or ensure regulatory approval. In addition, any drug approved under Subpart H, including voxelotor if it were approved, is required to be further evaluated in post-marketing studies to verify clinical benefit or on the basis of an effect on a clinical endpoint other than survival or irreversible morbidity.

We are also evaluating the safety and pharmacokinetics of single and multiple doses of voxelotor in adolescent and pediatric patients with SCD in a Phase 2a clinical trial, which we call the HOPE-KIDS 1 Study. In July 2017, we announced that we have expanded this open-label trial to include a new single-dose cohort in children aged 6-11.

In October 2015, the Food and Drug Administration, or FDA, granted Fast Track Designation for voxelotor for the treatment of SCD. In December 2015, the FDA granted Orphan Drug Designation for voxelotor for the treatment of SCD. In November 2016 voxelotor was granted Orphan Drug Designation in Europe for the treatment of SCD. In June 2017, the European Medicines Agency, or EMA, granted PRIME designation for voxelotor for the treatment of SCD. The PRIME program is a new regulatory mechanism that provides for early and proactive EMA support to medicine developers to help patients benefit as early as possible from innovative new products that have demonstrated the potential to significantly address an unmet medical need. In September 2017, the FDA granted Rare Pediatric Disease designation to voxelotor for the treatment of SCD. In January 2018, the FDA granted Breakthrough Designation to voxelotor for the treatment of SCD.

In August 2018, we entered into a license agreement with F. Hoffmann-La Roche Ltd. and Hoffmann-La Roche Inc. (together, "Roche") pursuant to which Roche granted the company an exclusive and sublicensable worldwide license under certain patent rights and know-how to develop and commercialize inclacumab, a novel fully human monoclonal antibody against P-selectin, including any modified compounds targeting P-selectin and derived from inclacumab, for all indications and uses, except diagnostic use. Roche retained a non-exclusive, worldwide, perpetual, royalty-free license to inclacumab solely for any diagnostic use. We plan to develop inclacumab as a treatment for vaso-occlusive crises in patients with SCD.

SCD is marked by red blood cell, or RBC, destruction and occluded blood flow and hypoxia, leading to anemia, stroke, multi-organ failure, severe pain crises, and shortened patient life span. Voxelotor inhibits abnormal hemoglobin polymerization, the underlying mechanism that causes sickling of RBCs. In our clinical trials to date of voxelotor in SCD patients, we observed reduced markers of red blood cell destruction, improvements in anemia, improvements in markers of tissue oxygenation, and reduced numbers of sickled RBCs.

We own or jointly own and have exclusively licensed rights to our product candidates in the United States, Europe and other major markets. We are the sole owner of issued U.S. patents covering voxelotor, including its composition of matter, methods of use, and a polymorph of voxelotor. These issued patents covering voxelotor will expire between 2032 and 2035, absent any applicable patent term extensions. We own or co-own additional pending patent applications in the United States and multiple foreign countries relating to voxelotor.

Beyond evaluation of voxelotor in SCD, we are also engaged in other research and development activities, all of which are currently in earlier development stages. In addition, we regularly evaluate opportunities to in-license, acquire or invest in new business, technology or assets or engage in related discussions with other business entities.

Since our inception in 2011, we have devoted substantially all of our resources to identifying and developing our product candidates, including conducting clinical trials and nonclinical studies and providing general and administrative support for these operations.

We have never been profitable and have incurred net losses in each year since inception. Our net losses were $125.0 million and $75.8 million for the nine months ended September 30, 2018 and 2017, respectively. As of September 30, 2018, we had an accumulated deficit of $422.9 million. To date, we have not generated any revenue. We do not expect to receive any revenue from any product candidates that we develop until we obtain regulatory approval and commercialize our products or enter into collaborative agreements with third parties. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations. We had $194.9 million in cash and cash equivalents and $287.2 million in marketable securities as of September 30, 2018.

Critical Accounting Polices and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with United States generally accepted accounting principles, or U.S. GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

There have been no material changes to our critical accounting policies from those described in "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in our Annual Report.

Results of Operations

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

	Three Months Ended September 30,			
	2018	2017	$ Change	% Change
	(in thousands, except percentages)			
Operating expenses:				
Research and development	$ 33,026	$ 20,952	$ 12,074	58%
General and administrative	12,450	8,228	4,222	51%
Total operating expenses	45,476	29,180	16,296	56%
Loss from operations	(45,476)	(29,180)	(16,296)	56%
Interest income, net	2,480	727	1,753	241%
Other income (expenses), net	(72)	(104)	32	(31)%
Net loss	$(43,068)	$(28,557)	$(14,511)	51%

Research and development

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

- employee-related expenses, which include salaries, benefits and stock-based compensation;
- expenses incurred under agreements with consultants, third-party research and manufacturing organizations, and investigative clinical trial sites that conduct research and development activities on our behalf;
- the costs related to production of clinical supplies, including fees paid to contract manufacturers;
- laboratory and vendor expenses related to the execution of nonclinical studies and clinical trials; and
- facilities and other allocated expenses, which include expenses for rent and maintenance of facilities, depreciation and amortization expense and other supplies.

We expense all research and development costs in the periods in which they are incurred. Costs for certain development activities are recognized based on an evaluation of the progress to completion of specific tasks using information and data provided to us by our vendors and clinical sites. Nonrefundable advance payments for goods or services to be received in future periods for use in research and development activities are deferred and capitalized. The capitalized amounts are then expensed as the related goods are delivered and the services are performed.

The largest component of our total operating expenses is our investment in research and development activities, including the clinical development of voxelotor. We allocate research and development salaries, benefits, stock-based compensation and indirect costs to voxelotor and other product candidates that we may pursue on a program-specific basis.

We expect our research and development expenses will increase in future periods as we continue to invest in research and development activities related to developing our product candidates, and as programs advance into later stages of development and we begin to conduct larger clinical trials. The process of conducting the necessary clinical research to obtain regulatory approval is costly and time-consuming, and the successful development of our product candidates is highly uncertain. As a result, we are unable to determine the duration and completion costs of our research and development projects or when and to what extent we will generate revenue from the commercialization and sale of any of our product candidates.

The following table summarizes our research and development expenses incurred during the respective periods (in thousands, except percentages):

	Three Months Ended September 30,			
	2018	2017	$ Change	% Change
Costs incurred by development program:				
Voxelotor for the treatment of SCD	$ 24,656	$ 15,563	$ 9,093	58%
Other preclinical programs	5,832	3,180	2,652	83%
Inclacumab for the treatment of SCD	2,469	—	2,469	100%
Voxelotor for the treatment of hypoxemic pulmonary disorders	69	2,209	(2,140)	(97)%
Total research and development expenses	$ 33,026	$ 20,952	$12,074	58%

Research and development expenses increased by $12.1 million or 58%, to $33.0 million for the three months ended September 30, 2018 from $21.0 million for the three months ended September 30, 2017. The increase was primarily due to increased internal and external expenses related to our SCD program for voxelotor of $9.1 million as we advanced this program, including expansion of our Phase 2a HOPE-KIDS 1 Study and our Phase 3 HOPE Study in 2018, as well as higher levels of manufacturing activities to support the studies. In addition, there was $2.5 million in increased internal and external costs associated with inclacumab primarily driven by the upfront payment of $2.0 million under the License Agreement with Roche in August 2018. Furthermore, there was $2.7 million in increased internal and external costs associated with preclinical programs. The increase is partially offset by a $2.1 million decrease in expenses related to our former hypoxemic pulmonary disorders program that was discontinued in October 2017. Stock-based compensation expense was $2.8 million for the three months ended September 30, 2018 and $1.6 million for the three months ended September 30, 2017. The increase was primarily due to hiring additional personnel and stock price appreciation.

General and administrative

General and administrative expenses increased by $4.2 million or 51%, to $12.5 million for the three months ended September 30, 2018 from $8.2 million for the three months ended September 30, 2017. The increase was primarily due to an increase of $3.2 million in salaries and benefits, including $2.0 million of higher stock-based compensation expense, as a result of hiring additional personnel and stock price appreciation and $1.2 million of higher salary and benefit costs as a result of hiring additional personnel, and an increase of $1.0 million in other general and administrative expenses, such as professional and consulting services, due to the growth of our operations.

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

	Nine Months Ended September 30,			
	2018	2017	$ Change	% Change
	(in thousands, except percentages)			
Operating expenses:				
Research and development	$ 94,543	$ 56,513	$ 38,030	67%
General and administrative	36,115	20,817	15,298	73%
Total operating expenses	130,658	77,330	53,328	69%
Loss from operations	(130,658)	(77,330)	(53,328)	69%
Interest income, net	5,768	1,856	3,912	211%
Other expenses, net	(101)	(298)	197	(66)%
Net loss	$(124,991)	$(75,772)	$(49,219)	65%

The following table summarizes our research and development expenses incurred during the respective periods:

	Nine Months Ended September 30,			
	2018	2017	$ Change	% Change
Costs incurred by development program:				
Voxelotor for the treatment of SCD	$ 72,940	$ 40,167	$32,773	82%
Other preclinical programs	17,775	9,278	8,497	92%
Inclacumab for the treatment of SCD	3,028	—	3,028	100%
Voxelotor for the treatment of hypoxemic pulmonary disorders	800	7,068	(6,268)	(89)%
Total research and development expenses	$ 94,543	$ 56,513	$38,030	67%

Research and development expenses increased by $38.0 million or 67%, to $94.5 million for the nine months ended September 30, 2018 from $56.5 million for the nine months ended September 30, 2017. The increase was primarily due to increased internal and external expenses related to our SCD program for voxelotor of $32.8 million as we advanced this program, including expansion of our Phase 2a HOPE-KIDS 1 Study and our Phase 3 HOPE Study in 2018 as well as higher levels of manufacturing activities to support the studies. In addition, there was $3.0 million in increased internal and external costs associated with inclacumab primarily driven by the upfront payment of $2.0 million under the License Agreement with Roche in August 2018. Furthermore, there was $8.5 million in increased internal and external costs associated with preclinical programs. The increase is partially offset by a $6.3 million decrease in expenses related to our former hypoxemic pulmonary disorders program that was discontinued in October 2017. Stock-based compensation expense was $9.6 million for the nine months ended September 30, 2018 and $4.1 million for the nine months ended September 30, 2017. The increase was primarily due to hiring additional personnel, stock price appreciation and vesting of market-condition stock awards.

General and administrative

General and administrative expenses increased by $15.3 million or 73%, to $36.1 million for the nine months ended September 30, 2018 from $20.8 million for the nine months ended September 30, 2017. The increase was primarily due to an increase of $11.7 million in salaries and benefits, including $8.1 million of higher stock-based compensation expense, as a result of hiring additional personnel, stock price appreciation and vesting of market-condition stock awards for achievement of certain market capitalization milestones and $3.5 million of higher salary and benefit costs, and an increase of $3.6 million in other general and administrative expenses, such as professional and consulting services, due to the growth of our operations.

Liquidity, Capital Resources and Plan of Operations

We are not profitable and have incurred losses and negative cash flows from operations each year since our inception. We have financed our operations primarily through sale of equity securities. In December 2017, we completed a follow-on offering under the shelf registration statement on Form S-3ASR pursuant to which we issued an aggregate of 2,631,579 shares of our common stock at a price of $38.00 per share. In addition, in January 2018, we sold an additional 394,736 shares of our common stock directly to the underwriters when they exercised their over-allotment option at the price of $38.00 per share. We received aggregate proceeds of $111.0 million from this follow-on offering, net of underwriting discounts and commissions, and offering expenses. In March 2018, we completed a follow-on offering and issued an aggregate of 4,600,000 shares of our common stock at a price of $54.00 per share, including 600,000 shares of common stock sold directly to the underwriters when they exercised their over-allotment option at the price of $54.00 per share. We received total proceeds of $240.6 million from the offering, net of underwriting discounts and commissions, and offering expenses. As of September 30, 2018, we had $194.9 million in cash and cash equivalents and $287.2 million in marketable securities.

Our primary use of cash is to fund operations, which consist primarily of research and development expenditures. Cash used to fund operations is impacted by the timing of when we pay these expenses, as reflected in the change in our outstanding accounts payable and accrued expenses.

We believe that our existing capital resources will be sufficient to fund our planned operations for at least twelve months subsequent to the issuance of these financial statements. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. We will continue to require additional financing to advance voxelotor through any completion of clinical development, to develop other potential product candidates we may identify and pursue and to fund operations for the foreseeable future. We will continue to seek funds through equity or debt financings, collaborative or other arrangements with corporate sources, or through other sources of financing. Adequate additional funding may not be available to us on acceptable terms, or at all. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategies. Our future funding requirements will depend on many factors, including:

- the time and cost necessary to conduct and complete our ongoing Phase 3 HOPE Study and Phase 2a HOPE-KIDS 1 Study of voxelotor for the potential treatment of SCD;
- the time and cost necessary to conduct and complete any additional clinical studies required to pursue regulatory approvals for voxelotor for SCD or any other indications, and the costs of post-marketing studies that could be required by regulatory authorities for any indications;
- the progress, data and results of our Phase 3 HOPE Study and Phase 2a HOPE-KIDS 1 Study, as well as potential other clinical trials of voxelotor for the potential treatment of SCD and our potential future clinical trials;
- the progress, timing, scope and costs of our nonclinical studies, our clinical trials and other related activities, including our ability to enroll subjects in a timely manner for our potential future clinical trials of voxelotor for SCD or for inclacumab or any other product candidates that we may identify and develop;
- the costs of obtaining clinical and commercial supplies of voxelotor, inclacumab and any other product candidates we may identify and develop;
- our ability to advance our development programs, including our program for the clinical investigation of voxelotor in SCD patients through nonclinical and clinical development, as well as inclacumab and any other potential product candidate programs we may identify and pursue, the timing and scope of these development activities, and the availability of accelerated approval for voxelotor and of any approval for any of our other product candidates;
- our ability to successfully obtain any regulatory approvals from any regulatory authorities, and the scope of any such regulatory approvals, to market and sell voxelotor, inclacumab and any other product candidates we may identify and develop in any territory(ies);
- our ability to successfully commercialize voxelotor, inclacumab and any other product candidates we may identify and develop in any territories;
- the manufacturing, selling, and marketing costs associated with the potential commercialization of voxelotor, inclacumab and any other product candidates we may identify and develop, including the cost and timing of establishing our sales and marketing capabilities in any territory(ies);
- the amount and timing of sales and other revenues from voxelotor, inclacumab and any other product candidates we may identify and develop, including the sales price and the availability of adequate third-party reimbursement;
- the cash requirements of any future acquisitions or discovery of product candidates;

- the time and cost necessary to respond to technological and market developments;
- the extent to which we may acquire or in-license other product candidates and technologies and the costs and timing associated with any such acquisitions or in-licenses;
- our ability to attract, hire, and retain qualified personnel; and
- the costs of maintaining, expanding, and protecting our intellectual property portfolio.

Further, our operating plan may change, and we may need additional funds to meet operational needs and capital requirements for clinical trials and other research and development expenditures. We currently have no credit facility or committed sources of capital. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidate, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical studies and research and development activities.

The following table summarizes our cash flows for the periods indicated (in thousands):

	Nine Months Ended September 30,	
	2018	2017
Cash used in operating activities	$(101,802)	$ (67,665)
Cash used in investing activities	(155,870)	(77,385)
Cash provided by financing activities	255,580	138,033
Net decrease in cash, cash equivalents and restricted cash	$ (2,092)	$ (7,017)

Cash flows from operating activities

Cash used in operating activities for the nine months ended September 30, 2018 was $101.8 million, consisting of a net loss of $125.0 million, which was partially offset by non-cash charges of $22.6 million for stock-based compensation and $2.3 million for net depreciation and amortization expense. The change in our net operating assets and liabilities was due primarily to an increase of $4.5 million of prepaid expenses and other current assets due to advance payments made in connection with our Phase 3 HOPE Study and our Phase 2a HOPE-KIDS 1 Study, a decrease of $2.1 million in accounts payable due to timing of payments and receipt of invoices, and a decrease of $1.4 million in accrued compensation primarily due to the timing of annual employee bonus payments. These were partially offset by an increase of $5.9 million in accrued liabilities due to the growth of our operations.

Cash used in operating activities for the nine months ended September 30, 2017 was $67.7 million, consisting of a net loss of $75.8 million, which was partially offset by non-cash charges of $8.9 million for stock-based compensation and $1.6 million for depreciation and amortization expense. The change in our net operating assets and liabilities was due primarily to an increase of $2.9 million of prepaid expenses and other current assets due to advance payments made in connection with our Phase 3 HOPE study.

Cash flows from investing activities

Cash used in investing activities for the nine months ended September 30, 2018 was $155.9 million, consisting of purchases of property and equipment for our office and laboratory facility of $4.9 million and purchases of marketable securities of $259.6 million, which are partially offset by maturities of marketable securities of $108.7 million.

Cash used in investing activities for the nine months ended September 30, 2017 was $77.4 million, consisting of the purchase of marketable securities of $127.7 million, and purchase of property and equipment for our office and laboratory facility of $1.8 million, which are partially offset by maturities of marketable securities of $52.1 million.

Cash flows from financing activities

Cash provided by financing activities for the nine months ended September 30, 2018 was $255.6 million, primarily from net proceeds of $255.1 million from the issuance of common stock in connection with our follow-on offerings completed in January 2018 and March 2018 and to a lesser extent, proceeds of $6.7 million from the issuance of common stock to participants in the employee stock purchase plan and exercise of stock options, which are partially offset by $6.3 million tax paid related to net shares settlement of equity awards.

Cash provided by financing activities for the nine months ended September 30, 2017 was $138.0 million, primarily from net proceeds of $135.6 million from the issuance of common stock in connection with our follow-on offering completed in February 2017 and to a lesser extent, proceeds of $3.1 million from the issuance of common stock to participants in the employee stock purchase plan and exercise of stock options.

Off-Balance Sheet Arrangements

As of September 30, 2018, we had no off-balance sheet arrangements as defined in Item 303(a)(4) of Regulation S-K as promulgated by the SEC.

Contractual Obligations and Other Commitments

In August 2018, we entered into an amendment to our Lease (the "Lease Amendment") to relocate and expand our leased premises to a to-be-constructed-building consisting of approximately 164,150 rentable square feet of space (the "Substitute Premises") when the Substitute Premises are ready for occupancy (the "Substitute Premises Commencement Date"). The Lease Amendment has a contractual term of 10 years from the Substitute Premises Commencement Date. The Lease Amendment grants us an option to extend the Lease Amendment for an additional 10-year period. We intend to vacate the Existing Premises and surrender and deliver the Existing Premises to landlord on or before the date which is sixty days after the Substitute Premises Commencement Date, upon which time we will have no further obligations with respect to the Existing Premises.

The following table summarizes our contractual obligations under the new and existing operating leases as of September 30, 2018 (in thousands):

	Total	2018	2019	2020	2021	2022	Thereafter
Operating lease obligations[1]	$138,433	$1,076	$4,406	$6,513	$11,642	$12,020	$102,776
Total contractual obligations	$138,433	$1,076	$4,406	$6,513	$11,642	$12,020	$102,776

(1) *The table above is prepared under the assumption that the Substitute Premises Commencement at the Substitute Premises starts on June 30, 2020.*

In August 2018, we entered into a license agreement (the "License Agreement") with F. Hoffmann-La Roche Ltd. and Hoffmann-La Roche Inc. (together, "Roche") pursuant to which Roche granted us an exclusive and sublicensable worldwide license under certain patent rights and know-how to develop and commercialize inclacumab for all indications and uses. Roche retained a non-exclusive, worldwide, perpetual, royalty-free license to inclacumab solely for any diagnostic use. As of September 30, 2018, we have paid Roche an upfront payment of $2.0 million. We are subject to contingent payments totaling approximately $125.5 million upon achievement of certain clinical development and regulatory milestones for inclacumab and commercial sales milestones if they occur before certain dates in the future. We are also subject to royalty payments to Roche based on tiered percentages ranging from low double-digit for the first annual net sales of inclacumab tier up to mid double-digit for annual net sales over $1.0 billion.

Accounting Pronouncements Adopted

In August 2016, the FASB issued ASU No. 2016-15, *Classification of Certain Cash Receipts and Cash Payments*. The new standard provides guidance on eight specific cash flow classification issues. The standard is effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. We adopted ASU No. 2016-15 in the first quarter of 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Restricted Cash*. The new standard requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. The standard is effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. We adopted ASU No. 2016-18 in the first quarter of 2018 using a retrospective transition method to each period presented. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation – Stock Compensation (Topic 718)*, which is intended to clarify and reduce the diversity in practice and cost and complexity when applying the guidance in Topic 718, Compensation – Stock Compensation, to a change to the terms or conditions of a share-based payment award. The new standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017. We adopted ASU No. 2017-09 in the first quarter of 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-04, *Investments – Debt Securities (Topic 320) and Regulated Operations (Topic 980): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 117 and SEC Release No. 33-9273*. The amendment of ASU No. 2018-04 adds, amends and supersedes various paragraphs that contain SEC guidance in ASC 320, *Investments-Debt Securities* and ASC 980, *Regulated Operations*. The amendments in this update were effective upon issuance in March 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

In March 2018, the FASB issued ASU No. 2018-05, *Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118*. The amendment of ASU No. 2018-05 adds various paragraphs that contain SEC guidance in ASC 740, *Income Taxes* and SEC Staff Accounting Bulletin No. 118. The amendments in this update were effective upon issuance in March 2018. We believe that the adoption of this new standard did not have a material impact on our consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation – Stock Compensation (Topic 718), Improvements to Nonemployee Share-Based Payment Accounting*, which is intended to improve the usefulness of the information provided to the users of financial statements while reducing cost and complexity in financial reporting. Under the new standard, nonemployee share-based payment awards within the scope of Topic 718 are measured at grant-date fair value of the equity instruments that an entity is obligated to issue when conditions necessary to earn the right to benefit from the instruments have been satisfied. These equity-classified non-employee share-based payment awards are measured at the grant date. Consistent with the accounting for employee share-based payment awards, an entity considers the probability of satisfying performance conditions when nonemployee share-based payment awards contain such conditions. The new standard also eliminates the requirement to reassess classification of such awards upon vesting. The new standard is effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2018. Early adoption is permitted, but no earlier than an entity's adoption date of Topic 606. We early adopted ASU No. 2018-07 effective January 1, 2018. The adoption of this new standard did not have a material impact on our consolidated financial statements.

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)* (or ASU 2016-02). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less will be accounted for similar to existing guidance for operating leases. The standard is effective for interim and annual periods beginning after December 15, 2018, with early adoption permitted. During 2018, the FASB issued ASU No. 2018-01, *Land Easement Practical Expedient for Transition to Topic 842*, ASU No. 2018-10, *Codification Improvements to Topic 842, Leases*, and ASU No. 2018-11, *Leases (Topic 842) – Targeted Improvements*, which provided an entity the modified retrospective transition approach to initially account for the impact of the adoption with a cumulative adjustment to accumulated deficit on the effective date of the ASU 2016-02, January 1, 2019 rather than January 1, 2017, which would eliminate the need to restate amounts presented prior to January 1, 2019. We plan to adopt the standard on January 1, 2019 and to elect the modified retrospective transition method for adoption as described above. The new standard also provides a number of optional practical expedients that allow entities to not (i) reassess whether any expired or existing contracts are considered or contain leases; (ii) reassess the lease classification for any expired or existing leases; and (iii) reassess initial direct costs for any existing leases. We plan to elect the use of practical expedients. We expect that this standard will have a material effect on our consolidated financial statements. While we continue to evaluate the provisions of ASC 842 to determine the impact the adoption will have on our consolidated financial statements, we currently believe the most significant effects relate to the recognition of new right-of-use assets and lease liabilities on our consolidated balance sheet. We do not expect a significant change in our leasing activities between now and adoption.

In February 2018, the FASB issued ASU No. 2018-02, *Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*. The amendment of ASU No. 2018-02 states an entity may elect to reclassify the income tax effects of the Tax Cuts and Jobs Act of 2017 (the "Tax Cuts and Jobs Act") on items within accumulated other comprehensive income to retained earnings. The amendments in this update are effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2018. Early adoption is permitted. We believe that the adoption of this new standard will have no material impact on our consolidated financial position or results of operations and have not elected to early adopt the amendment.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820)*. The new standard modifies the disclosure requirements on fair value measurements in Topic 820, Fair Value Measurement, including removals of, modification to, and additional disclosure requirements from Topic 820. The amendment of ASU No. 2018-13 removes disclosure requirements from Topic 820 in the areas of (1) the amount of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy; (2) the

policy for timing of transfers between levels, and (3) the valuation processes for Level 3 fair value measurements. The amendments in this update are effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Except for certain amendments related to Level 3 fair value measurements, all the other amendments should be applied retrospectively to all periods presented upon their effective date. Early adoption is permitted upon issuance of the ASU No. 2018-13. We believe that the adoption of this new standard will have no material impact on our consolidated financial position or results of operations and have not elected to early adopt the amendment.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40), Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* (or ASU 2018-15). The amendments in ASU 2018-15 align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by the amendments in ASU 2018-15. Accordingly, the amendment of ASU No. 2018-15 requires an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. The amendment in ASU 2018-15 also requires the entity (customer) to expense the capitalized implementation cost of a hosting arrangement that is a service contract over the term of the hosting arrangement. The amendment in ASU 2018-15 further requires the entity to present the expense related to the capitalized implementation costs in the same line item in the statement of income as the fees associated with the hosting element (service) of the arrangement and classify payment for capitalized implementation costs in the statement of cash flows in the same manner as payments made for fees associated with the hosting element. The entity is also required to present the capitalized implementation costs in the statement of financial position in the same line item that a prepayment for the fees of the associated hosting arrangement would be presented. The amendments in this update are effective for annual reporting periods beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption of the amendments in this update is permitted, including adoption in any interim period for all entities. The amendments in this update should be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. We believe that the adoption of this new standard will have no material impact on our consolidated financial position or results of operations and have not elected to early adopt the amendment.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

Our market risks as of September 30, 2018 have not changed materially from those discussed in Item 7A of our Annual Report on Form 10-K for the year ended December 31, 2017, filed with the SEC on February 27, 2018.

Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15(b) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), our management, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of September 30, 2018. Based on the evaluation of our disclosure controls and procedures as of September 30, 2018, our Chief Executive Officer and Chief Financial Officer have concluded that, as of September 30, 2018, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting (as defined in Rules 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 controls over financial reporting.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

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

Item 1A. Risk Factors.

This Quarterly Report on Form 10-Q contains forward-looking information based on our current expectations. Because our business is subject to many risks and our actual results may differ materially from any forward-looking statements made by or on behalf of us, this section includes a discussion of important factors that could affect our business, operating results, financial condition and the trading price of our common stock. This discussion should be read in conjunction with our condensed consolidated financial statements as of September 30, 2018 and December 31, 2017 and the notes accompanying those consolidated financial statements.

Risks Related to Our Financial Position and Need for Additional Capital

We are a clinical development-stage biopharmaceutical company with a limited operating history. We have incurred significant losses since our inception and anticipate that we will continue to incur losses for the foreseeable future. We have only one product candidate in clinical development and have not generated any revenue since our inception, which, together with our limited operating history, may make it difficult for you to assess our future viability.

We are a clinical development-stage biopharmaceutical company with a limited operating history upon which you can evaluate our business and prospects. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. To date, we have focused principally on developing our lead product candidate, voxelotor, which is our only product candidate in clinical development. In August 2018, we entered into an exclusive worldwide license agreement with F. Hoffman-LaRoche and Hoffman-La Roche Inc. (together, “Roche”) for the development and commercialization of inclacumab, a novel fully human monoclonal antibody against P-selectin, as a treatment for vaso-occlusive crises (“VOC”) in patients with SCD.

We are not profitable and have incurred losses in each year since our inception in February 2011 and the commencement of our principal operations in May 2012. Our net losses for the nine months ended September 30, 2018 and 2017 were $125.0 million and $75.8 million, respectively. As of September 30, 2018, we had an accumulated deficit of $422.9 million. We have not generated any revenue since our inception, and have financed our operations primarily through the sale of equity securities. We continue to incur significant research and development and other expenses related to our ongoing operations and expect to incur losses for the foreseeable future. We anticipate these losses will increase as we:

- continue to advance voxelotor in clinical development, including our ongoing Phase 3 HOPE Study and Phase 2a HOPE-KIDS 1 Study of voxelotor for the potential treatment of patients with SCD, and additional clinical trials ongoing or in the future in SCD patients;
- establish and maintain manufacturing and supply relationships with third parties that can provide adequate supplies (in amount and quality) of voxelotor to support further clinical development and, if approved, commercialization;
- seek and obtain regulatory and marketing approvals for voxelotor for SCD or any other indication we may pursue;
- build a sales and marketing organization or enter into selected collaborations to commercialize voxelotor for any indication, if approved;
- build a medical affairs organization to advance our engagement with healthcare providers and stakeholders;
- advance our other programs, including inclacumab, through nonclinical and clinical development and commence development activities for any additional product candidates we may identify and pursue; and
- expand our organization to support our research, development, medical, and commercialization activities and our operations as a public company.

We have never generated any revenues from product sales and may never be able to develop or commercialize a marketable drug product or achieve profitability. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods. Our failure to maintain adequate cash reserves to advance our development programs or achieve approval to commercialize any products, or our failure to achieve sustained profitability would depress the value of our company and could impair our ability to raise capital, expand our business, diversify our research and development pipeline, market voxelotor or any other product candidates we may identify and pursue (if approved), or continue our operations. Our prior losses, combined with expected future losses, have had and will continue to have an adverse effect on our stockholders’ equity and working capital.

We will require substantial additional funding to achieve our business goals. If we are unable to obtain this funding when needed and on acceptable terms, we could be forced to delay, limit or terminate our product development efforts or other operations. Raising additional capital may subject us to unfavorable terms, cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our product candidates and technologies.

We are currently advancing voxelotor through clinical development for SCD, including in a multi-national Phase 3 clinical trial in adult and adolescent patients with SCD called the HOPE Study. We are also evaluating the safety and pharmacokinetics of single and multiple doses of voxelotor in a Phase 2a clinical trial in adolescent and pediatric patients with SCD, which we expanded to include a new single-dose cohort in children aged 6-11. Voxelotor is currently our only product candidate in clinical development, although we are conducting nonclinical research activities in other programs.

Developing biopharmaceutical products is expensive and time-consuming, and we expect our research and development expenses to increase substantially in connection with our ongoing activities, particularly as we advance voxelotor, inclacumab and other product candidates that we may identify and pursue in clinical trials. As of September 30, 2018 and December 31, 2017, we had working capital of $365.3 million and $298.0 million, respectively, and capital resources consisting of cash and cash equivalents and short and long-term marketable securities totaling $482.1 million and $329.4 million, respectively. We expect that our existing capital resources consisting of cash and cash equivalents and marketable securities will be sufficient to fund our operations for at least the next twelve months. Because the outcome of any clinical development and regulatory approval process is highly uncertain, we cannot reasonably estimate the actual capital amounts necessary to successfully complete the development, regulatory approval process and commercialization of voxelotor or any other future product candidates.

Our operating plan may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations or license and development agreements. Any additional fundraising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to develop and commercialize voxelotor, inclacumab or any other product candidates that we may identify and pursue. Moreover, such financing may result in dilution to stockholders, imposition of debt covenants and repayment obligations, or other restrictions that may affect our business. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans.

Our future funding requirements will depend on many factors, including, but not limited to:

- the time and cost necessary to conduct and complete our ongoing Phase 3 HOPE Study and Phase 2a HOPE-KIDS 1 Study of voxelotor for the potential treatment of SCD;
- the time and cost necessary to conduct and complete any additional clinical studies required to pursue regulatory approvals for voxelotor for SCD or any other indications, and the costs of post-marketing studies that could be required by regulatory authorities for any indications;
- the progress, data and results of our Phase 3 HOPE Study and Phase 2a HOPE-KIDS 1 Study, as well as potential other clinical trials of voxelotor for the potential treatment of SCD and our potential future clinical trials;
- the progress, timing, scope and costs of our nonclinical studies, our clinical trials and other related activities, including our ability to enroll subjects in a timely manner for our potential future clinical trials of voxelotor for SCD or for inclacumab or any other product candidate that we may identify and develop;
- the costs of obtaining clinical and commercial supplies of voxelotor, inclacumab and any other product candidates we may identify and develop;
- our ability to advance our development programs, including our program for the clinical investigation of voxelotor in SCD patients through nonclinical and clinical development, as well as inclacumab and any other potential product candidate programs we may identify and pursue, the timing and scope of these development activities, and the availability of accelerated approval for voxelotor and of any approval for any of our other product candidates;
- our ability to successfully obtain any regulatory approvals from any regulatory authorities, and the scope of any such regulatory approvals, to market and sell voxelotor, inclacumab and any other product candidates we may identify and develop in any territory(ies);
- our ability to successfully commercialize voxelotor, inclacumab and any other product candidates we may identify and develop in any territories;
- the manufacturing, selling, and marketing costs associated with the potential commercialization of voxelotor, inclacumab and any other product candidates we may identify and develop, including the cost and timing of establishing our sales and marketing capabilities in any territory(ies);
- the amount and timing of sales and other revenues from voxelotor, inclacumab and any other product candidates we may identify and develop, including the sales price and the availability of adequate third-party reimbursement;
- the cash requirements of any future acquisitions or discovery of product candidates;
- the time and cost necessary to respond to technological and market developments;
- the extent to which we may acquire or in-license other product candidates and technologies, and the costs and timing associated with any such acquisitions or in-licenses;

- our ability to attract, hire, and retain qualified personnel; and
- the costs of maintaining, expanding, and protecting our intellectual property portfolio.

Additional funds may not be available when we need them, on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to delay, limit or terminate our development or commercialization activities for voxelotor, inclacumab or for any other product candidates we may identify and pursue, or be unable to expand our operations or otherwise capitalize on our business opportunities, as desired, which could materially and adversely affect our business, prospects, financial condition and results of operations.

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

If we are unable to obtain regulatory approval in one or more jurisdictions for voxelotor, inclacumab or any future product candidates that we may identify and develop, our business will be substantially harmed.

We cannot commercialize a product until the appropriate regulatory authorities have reviewed and approved the product candidate. Approval by the FDA and comparable foreign regulatory authorities is lengthy and unpredictable, and depends upon numerous factors. Approval policies, regulations, or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions, which may cause delays in the approval or the decision not to approve an application. We have not obtained regulatory approval for any product candidate, including voxelotor, and it is possible that voxelotor, inclacumab and any other product candidates we may seek to develop in the future may never obtain any regulatory approval.

Applications for voxelotor or any other product candidates we may develop could fail to receive regulatory approval for many reasons, including but not limited to:

- we may not be able to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities (including the European Medicines Agency, or EMA) that voxelotor or any other product candidates we may develop are safe and effective for any proposed indications;
- the FDA or comparable foreign regulatory authorities may disagree with our plans or expectations regarding the pathways and endpoints for approval, including the availability of accelerated approval, or the design or implementation of our nonclinical studies or clinical trials;
- the populations studied in our clinical programs may not be sufficiently broad or representative to assure safety or demonstrate efficacy in the full population for which we seek approval;
- the FDA or comparable foreign regulatory authorities may require additional nonclinical studies or clinical trials beyond those we anticipate;
- the FDA or comparable foreign regulatory authorities may disagree with our interpretation of data and results from our nonclinical studies or clinical trials;
- the data and results collected from nonclinical studies or clinical trials of voxelotor and any other product candidates that we may identify and pursue may not be sufficient to support the submission of a new drug application, or NDA, or any other submission for regulatory approval in any other jurisdiction;
- we may be unable to demonstrate to the FDA or comparable foreign regulatory authorities that a product candidate's risk-benefit ratio for its proposed indication is acceptable;
- the FDA or comparable foreign regulatory authorities may find deficiencies with or fail to approve the manufacturing processes, test procedures and specifications, or facilities of third-party manufacturers with which we contract and rely on for all clinical and commercial supplies of voxelotor and any other product candidates (if any); and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may change in a manner that renders our development or manufacturing efforts insufficient for approval.

The lengthy regulatory review and approval process, as well as the inherent unpredictability of the results of nonclinical studies and clinical trials, and our reliance on third party manufacturers for any product candidates, may result in our failure to obtain regulatory approval to market voxelotor and other product candidates that we may pursue in the United States or elsewhere, which would significantly harm our business, prospects, financial condition and results of operations.

Access to expedited development and regulatory approval programs for voxelotor, including accelerated approval under the FDA's Subpart H regulations ("Subpart H"), may not actually lead to a faster development or regulatory review or approval process, may not lead to any approval, and may lead to a Subpart H approval that is later withdrawn.

We believe there may be an opportunity to accelerate the development and regulatory approval process for voxelotor through one or more of the FDA's expedited programs, such as fast track, breakthrough therapy, accelerated approval under Subpart H, or priority review, or through EMA's new PRIME program, and we have pursued and intend to pursue such expedited programs for voxelotor. For example, we are discussing with the FDA the potential for accelerated approval of voxelotor under Subpart H based on demonstration of efficacy on the primary endpoint in the Phase 3 HOPE Study, which measures hemoglobin levels, without requiring a showing of efficacy on a secondary endpoint. However, we cannot be assured that the FDA will agree with this approach, or that voxelotor or any other product candidates that we may develop will qualify for or benefit from any such programs in the United States, including under Subpart H, or any foreign regulatory jurisdictions.

In 2015, the FDA designated our investigation of voxelotor for the treatment of SCD as a Fast Track development program. Fast Track is a different review process designated to facilitate the development of drugs that treat serious conditions and demonstrate the potential to address an unmet medical need. While Fast Track designation may provide more frequent access and communication with the FDA, it does not ensure that regulatory review or approval for voxelotor will occur on an expedited basis, if at all.

In September 2017, the FDA granted Rare Pediatric Disease designation to voxelotor for the treatment of SCD. The FDA defines a rare pediatric disease as a serious or life-threatening disease in which the serious or life-threatening manifestations primarily affect individuals age 18 years or younger, and is a rare disease that impacts fewer than 200,000 individuals in the United States. The Rare Pediatric Disease designation provides incentives to advance the development of rare disease drugs and biologics. Additionally, voxelotor may be eligible for a voucher that can be redeemed to obtain priority review for any subsequent marketing application. However, this designation does not ensure that regulatory review or approval for voxelotor will occur on an expedited basis, if at all.

In January 2018, the FDA granted breakthrough therapy designation to voxelotor for the treatment of SCD. A drug may be eligible for designation by FDA as a breakthrough therapy if the drug is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints.

In June 2018, we announced top-line data from Part A of the Phase 3 HOPE Study in approximately 154 patients, including that in Part A voxelotor achieved statistically significant results for both doses of voxelotor studied (1500mg and 900 mg) for the primary endpoint of a specific increase in hemoglobin level versus placebo. In addition, based on the top-line data, we announced that we believe voxeletor meets the standard for potential accelerated approval under Subpart H, and that we are in discussions with the FDA regarding the potential for such approval including design of required post-marketing confirmatory studies. The FDA grants accelerated approval under Subpart H for new drugs that address serious or life-threatening illnesses and that provide meaningful therapeutic benefit to patients over existing treatments. Under Subpart H, the FDA may grant marketing approval for a new drug product on the basis of adequate and well-controlled clinical trials establishing that the drug product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit. Drugs approved under Subpart H are required to be further evaluated in post-marketing studies to verify clinical benefit or on the basis of an effect on a clinical endpoint other than survival or irreversible morbidity. We have no assurance that the FDA will agree to any accelerated approval for voxelotor under Subpart H, or that regulatory review or approval for voxelotor will occur on an expedited basis, if at all. In addition, even if accelerated approval under Subpart H is granted by the FDA for voxelotor, we may not be able to complete post-marketing confirmatory studies required to maintain any such approval, or data and results from required post-marketing studies may not verify voxelotor's clinical benefit and maintain any such approval.

Access to any expedited program through the FDA, including accelerated approval under Subpart H, or any other regulatory authority does not ensure faster development timelines or faster review or approval of any NDA compared to conventional FDA or foreign regulatory procedures, and it does not change many of the standards for approval or ensure that we will obtain regulatory approval for voxelotor or any other product candidates we may develop. Furthermore, access to any expedited program may be withdrawn by the FDA or a foreign regulatory authority if it believes that the program is no longer supported by data from our clinical development, and accelerated approval under Subpart H may be withdrawn if, among other reasons, required post-marketing confirmatory studies are not completed or if the FDA determines the results of post-marketing confirmatory studies do not verify clinical benefit.

In June 2017, the EMA granted PRIME designation for voxelotor for the treatment of SCD. The PRIME program is a new regulatory mechanism that provides for early and proactive EMA support to medicine developers to help patients benefit as early as possible from innovative new products that have demonstrated the potential to significantly address an unmet medical need.

We are heavily dependent on the success of voxelotor in our development program for sickle cell disease, and all of our other programs are still in the earlier development stages. If we are unable to successfully complete clinical development, obtain and maintain regulatory approval for, and commercialize voxelotor for SCD, or experience delays in doing so, our business will be materially harmed.

To date, we have invested a majority of our efforts and financial resources in the nonclinical and clinical development of our lead and initial product candidate voxelotor, including conducting nonclinical studies and clinical trials and providing general and administrative support for these operations. We do not have any other clinical product candidates, and our only clinical development program for voxelotor is in SCD. Our future success is highly dependent on our ability to successfully develop, obtain and maintain regulatory approval for, and commercialize voxelotor for SCD, the only indication for which voxelotor is currently in clinical development. Before we can generate any revenues from sales of voxelotor, we must conduct substantial additional clinical development (including, among others, multiple ongoing clinical studies such as our Phase 3 HOPE Study and toxicology studies, and possibly additional future nonclinical studies and clinical trials to demonstrate safety and efficacy of voxelotor for SCD or any other potential indication we may pursue). In addition, we will need to seek and obtain, and maintain, regulatory approval for SCD or any other potential indication, secure an adequate manufacturing supply to support larger clinical trials and commercial sales and build a commercial organization. Further, the success of voxelotor as a potential commercial product will also depend on patent and trade secret protection, acceptance of voxelotor by patients, the medical community and third-party payors, its ability to compete with other therapies, the status and availability of healthcare coverage and adequate reimbursement, and maintenance of an acceptable safety and efficacy profile following approval, among other factors. If we do not achieve all of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize voxelotor, which would materially harm our business.

Voxelotor is currently our only product candidate to have advanced into clinical trials, and is currently only being tested in SCD. We are developing voxelotor as an oral, once-daily therapy for the potential treatment of SCD, and are currently evaluating voxelotor in SCD patients in our ongoing HOPE-KIDS 1 Study, which is a Phase 2a clinical trial in adolescent and pediatric SCD patients, and our ongoing multi-national HOPE Study, which is a Phase 3 clinical trial in adult and adolescent SCD patients.

All of our other programs are in earlier stages of research and development, and we have no other product candidates in clinical trials other than voxelotor. As a result, even after in-licensing the inclacumab program, we are very dependent on voxelotor for our business, prospects, financial condition and results of operations.

We are also very dependent on the data and results that we obtain over time from our most advanced clinical trial of voxelotor. In late 2016, we initiated the Phase 3 HOPE Study in 400 SCD patients, aged 12 years and older, who have had at least one episode of vaso-occlusive crisis in the previous year. The primary endpoint of the HOPE Study relates to the proportion of patients who achieve an increase in hemoglobin levels (compared to baseline) as pre-specified in the study protocol. We have not previously conducted any clinical study of voxelotor in SCD patients using this primary endpoint, and we do not believe this measure has been used as a primary endpoint for any registration studies for any other SCD therapies. The HOPE Study also used a new patient reported outcomes, or PRO, instrument that we developed, and that has not been utilized before in any clinical studies, to generate data for a secondary endpoint in the HOPE Study.

In June 2018, we announced top-line data from Part A of the Phase 3 HOPE Study in approximately 154 patients, including that in Part A voxelotor achieved statistically significant results for both doses of voxelotor studied (1500 mg and 900 mg) for the primary endpoint of a pre-specified increase in hemoglobin level versus placebo. We also announced that the PRO data in Part A of the HOPE Study were difficult to interpret due to low baseline symptom scores and high inter-subject and intra-subject variability, and as a result we do not plan to utilize the PRO as a secondary endpoint. In addition, we announced that there were numerically fewer vaso-occlusive crisis episodes for patients in each voxelotor arm as compared to placebo, although the result did not reach statistical significance. We also announced that we do not plan additional enrollment in the HOPE Study pending ongoing discussions with the FDA, but will continue dosing of patients currently enrolled in the study, and that we plan to focus on the primary endpoint for potential accelerated approval under Subpart H, which we believe obviates the need for a key secondary endpoint to achieve approval under Subpart H.

While we discuss the potential for a Subpart H filing for potential approval of voxelotor in the United States, we continue to generate additional data from patients enrolled in the Phase 3 HOPE Study. There is a risk that the additional data generated could be different from, including less positive in terms of efficacy and/or safety, than the data generated and discussed with the FDA to date. In that case, the potential for a Subpart H approval could be delayed or eliminated.

We do not know if the Part A data and results will be sufficient to support accelerated approval for voxelotor by the FDA. If accelerated approval is not granted, then we would experience a significant delay in our voxelotor development program and in any potential approval, given our decision to pursue accelerated approval rather than continue HOPE Study enrollment and shift from Part A to Part B of the HOPE Study (as originally designed). As a result, failure to obtain accelerated approval for voxelotor under Subpart H will result in a significant delay in any potential approval of voxelotor. If we were required to pursue full approval for voxelotor (not under Subpart H), we might not achieve any such approval without further clinical studies of voxelotor, which would significantly delay or curtail any potential pathway to full approval.

As part of an NDA submission under Subpart H, if any, we must agree with the FDA on the design of, and commit to conduct, post-marketing confirmatory studies to verify the clinical benefit of voxelotor. Accelerated approval of voxelotor under Subpart H, if any, may be withdrawn if required post-marketing confirmatory studies are not completed or if the FDA determines the results of such studies do not verify clinical benefit. We do not have a special protocol assessment agreement in place with the FDA. We are in the process of seeking input from various European regulatory authorities regarding a pathway to approval of voxelotor for the potential treatment of SCD patients based on the HOPE Study.

We cannot be certain that voxelotor or any other product candidates that we seek to develop will be successful in nonclinical studies or clinical trials or receive and maintain any regulatory approvals. If we do not receive regulatory approval for, regulatory approval is withdrawn from, or we otherwise fail to successfully commercialize, voxelotor or any other product candidates, we are likely to need to spend significant additional time and resources to identify other product candidates, advance them through nonclinical and clinical development and apply for regulatory approvals, which would adversely affect our business, prospects, financial condition and results of operations.

The development of voxelotor as a potential disease-modifying anti-sickling agent in SCD patients represents a novel therapeutic approach, and there is a risk that the outcomes of our clinical trials will not be favorable or otherwise support any decision to seek or grant any regulatory approval.

We have concentrated our product research and development efforts on developing novel, mechanism-based therapeutics for the treatment of grievous blood-based disorders with significant unmet need, and our future success depends on the success of this therapeutic approach. The clinical trial requirements of the FDA and other comparable regulatory agencies and the criteria these regulators use to determine the safety and efficacy of any product candidate vary substantially according to the type, complexity, novelty and intended use and market of the potential product. To date, there are only two approved therapies for SCD, hydroxyurea and L-glutamine, and there are no approved therapies directed toward preventing the polymerization of hemoglobin molecules as a mechanism to reduce RBC sickling in SCD patients. As a result, the design and conduct of clinical trials for a therapeutic product candidate such as voxelotor that targets this mechanism in SCD patients are subject to unknown risks, and we may experience setbacks with our ongoing or planned clinical trials of voxelotor in SCD because of the limited clinical experience with its mechanism of action in these patients.

In particular, regulatory authorities in the United States and Europe have not issued definitive guidance as to how to measure and achieve efficacy in treatments for SCD. Based on our discussions with the FDA regarding the design for the HOPE Study, we have determined to measure change in hemoglobin levels as the primary endpoint in the Phase 3 HOPE Study. This primary endpoint has not been used previously in a registration study for any SCD treatment. As a result, regulators have not determined that such data would signify a clinically meaningful result in SCD patients or would support seeking or obtaining regulatory approval. In addition, we cannot be assured that this primary endpoint will be sufficient to support accelerated approval of voxelotor under Subpart H, which requires the FDA to agree that our hemoglobin-based primary endpoint is an intermediate clinical endpoint that is reasonably likely to predict clinical benefit.

We did not achieve statistically significant results with respect to either potential key secondary endpoint in Part A of the HOPE Study (relating to vaso-occlusive crisis episodes and to the PRO), and we may not achieve key endpoints in other clinical trials, such as any post-marketing confirmatory studies. In addition, we may not achieve the same results with respect to the primary endpoint in Part A of the HOPE Study in other ongoing of future clinical trials. Any inability to design clinical trials with protocols and endpoints acceptable to applicable regulatory authorities, and to obtain and maintain regulatory approvals for voxelotor and any other product candidates that we may pursue, would have an adverse impact on our business, prospects, financial condition and results of operations.

Results of earlier studies may not be predictive of future clinical trial results, and initial studies may not establish an adequate safety or efficacy profile for voxelotor, inclacumab and other product candidates that we may pursue to justify proceeding to advanced clinical trials or an application for regulatory approval.

The results of nonclinical studies and clinical trials of voxelotor, inclacumab and of any future product candidates that we may pursue may not be predictive of the results of later-stage clinical trials, and interim results of a clinical trial may not necessarily predict final results. For example, we were previously pursuing the clinical development of voxelotor as a potential treatment for idiopathic pulmonary fibrosis, or IPF, and decided in October 2017 to halt development of voxelotor for IPF due to the totality of the data we obtained from two Phase 2a clinical trials and a Phase 1 study, which did not demonstrate sufficient overall clinical benefit to justify continuing the program. In addition, our nonclinical studies and clinical trials to date of voxelotor in SCD have involved mostly one

genotype of SCD, known as HbSS, and the results of these studies may not be replicated in other genotypes of SCD in the HOPE Study or in subsequent clinical trials. The HOPE Study of voxelotor in SCD is not limited to only the HbSS genotype. Additionally, any positive results generated in our Phase 1/2 clinical trial of voxelotor in SCD in adults do not ensure that we will achieve similar results in our ongoing Phase 2a HOPE-KIDS 1 Study, in adolescent and pediatric patients with SCD, which we expanded in July 2017 to include an additional single-dose cohort in children aged 6-11, or in any other potential studies of voxelotor. Our later stage clinical trials, including the HOPE Study, involve significantly broader patient populations than those in earlier clinical trials.

Product candidates in later stages of clinical trials, such as our HOPE Study, may fail to demonstrate the desired safety and efficacy despite having progressed through nonclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier studies, and we cannot be certain that we will not face similar setbacks.

In addition, nonclinical and clinical data are often susceptible to various interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in nonclinical studies and clinical trials have nonetheless failed to obtain marketing approval, in part because of differing interpretations of data and results by regulatory authorities.

Our failure to demonstrate the required characteristics to support marketing approval for voxelotor, inclacumab or any other product candidate we may choose to develop in any ongoing or future clinical trials would substantially harm our business, prospects, financial condition and results of operations.

Before we are able to submit voxelotor for marketing approval, the FDA and comparable foreign regulatory authorities may impose additional requirements, the scope of which are not fully known at this time.

Before we can submit an NDA to the FDA for voxelotor for any potential indication, we must successfully complete our clinical trials. The FDA typically requires at least two pivotal, well-controlled Phase 3 clinical trials as a condition to the submission of an NDA and does not usually consider a single Phase 3 clinical trial to be adequate to support product approval. The FDA will typically only consider relying on one pivotal trial if, in addition, other well-controlled studies of the drug exist (for example, for other dosage forms or in other populations) or if the pivotal trial is a multi-center trial that provides highly reliable and statistically strong evidence of an important clinical benefit, such as effect on survival, organ function or PRO, and a confirmatory study would have been difficult to conduct on ethical grounds.

However, based on the data from Part A of the Phase 3 HOPE Study, we are in discussions with the FDA regarding potential accelerated approval of voxelotor under Subpart H. If accelerated approval under Subpart H is granted, we will be required to conduct post-marketing confirmatory studies sufficient to verify voxelotor's clinical benefit, and approval may be withdrawn if such studies are not completed or the FDA determines such studies are insufficient to verify clinical benefit. The FDA may also require a longer follow-up period for subjects treated with voxelotor prior to accepting an NDA submission. We do not have a special protocol assessment agreement in place with the FDA. We are in the process of seeking input from various European regulatory authorities regarding a pathway to approval of voxelotor for the potential treatment of SCD patients based on the HOPE Study.

The FDA or the comparable foreign authorities may not consider the results of our ongoing, planned or potential future clinical trials, to be sufficient for approval of voxelotor for SCD patients, particularly to support potential accelerated approval under Subpart H. Any post-marketing confirmatory studies, and any additional clinical trials or data beyond that which we currently anticipate, that may be required by the FDA or comparable foreign regulatory authorities would result in increased costs and potential delays in the clinical development and marketing approval process, which may require us to expend more resources than are available to us. In addition, it is possible that the FDA and the comparable foreign authorities may have divergent opinions on the elements necessary for a successful NDA and marketing authorization application, or MAA, respectively, which may cause us to alter our development, regulatory and/or commercialization strategies.

We may encounter substantial delays in conducting or completing our clinical trials, which in turn will result in additional costs and may ultimately prevent successful or timely completion of the clinical development and commercialization of voxelotor, inclacumab or any other product candidates we may identify and pursue.

Before obtaining marketing approval from regulatory authorities for the sale of any our product candidates, we must conduct extensive clinical trials to demonstrate the safety and efficacy of the product candidates in humans. In addition, if accelerated approval under Subpart H is granted, we must conduct post-marketing confirmatory studies to verify clinical benefit. Clinical testing is expensive, time-consuming and uncertain as to outcome. Currently, we are conducting the ongoing Phase 2a HOPE-KIDS 1 Study and the ongoing Phase 3 HOPE Study of voxelotor. We cannot guarantee that these studies, and any other clinical trials, including any post-marketing confirmatory studies for voxelotor, or any other product candidates we may pursue will be conducted as planned or completed on schedule, if at all. A failure of one or more clinical trials can occur at any stage of testing. Events that may prevent successful or timely completion of clinical development include:

- delays or failures in reaching a consensus with regulatory agencies on study design, including clinical endpoints sufficient to support an approval decision;
- delays or failures to receive approval for conduct of clinical studies in one or more geographies which could result in delays in enrollment and availability of data and results;
- delays or failures in reaching agreement on acceptable terms with a sufficient number of prospective contract research organizations, or CROs, and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- delays in obtaining required Institutional Review Board, or IRB, or ethics committee approval for each clinical trial site;
- delays in recruiting a sufficient number of suitable patients to participate in our clinical trials;
- imposition of a clinical hold by any regulatory authority, including if imposed due to safety concerns after an inspection of our clinical trial operations or study sites;
- failure by our CROs, clinical sites, participating clinicians or patients, other third parties or us to adhere to clinical trial, regulatory or legal requirements;
- failure to perform in accordance with the FDA's good clinical practices, or GCPs, or applicable regulatory requirements in other countries;
- delays in the testing, validation, manufacturing and delivery of sufficient quantities of our product candidates or study related devices (such as the hand-held PRO instrument being used by patients in our HOPE Study) to the clinical sites and patients;
- delays in having patients enroll or complete participation in a study in accordance with applicable protocols or protocol amendments, or return for post-treatment follow-up;
- reduction in the number of participating clinical trial sites or patients, including by dropping out of a trial;
- failure to address in an adequate or timely manner any patient safety concerns that arise during the course of a trial;
- unanticipated costs or increases in costs of clinical trials of our product candidates;
- the occurrence of serious adverse events or other safety concerns associated with our product candidates; or
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols or obtaining additional IRB or other approvals to conduct or complete clinical studies of our product candidates.

We could also encounter delays if a clinical trial is suspended or terminated for any reason (which could occur as a result of termination by us, by the IRBs or ethics committees of the institutions in which such trials are being conducted, by an independent Safety Review Board for such trial, or by the FDA or other regulatory authorities). A clinical trial can be suspended or terminated for a wide variety of reasons, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by us, or the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, or failure to demonstrate a benefit from using a drug candidate. In addition, if we make manufacturing or formulation changes to our product candidates, we may need to conduct additional studies to bridge the development program from the data and results for the earlier product candidate to the modified product candidate.

Clinical trial delays could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we do, which could impair our ability to successfully commercialize our product candidates. In addition, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process or jeopardize our ability to maintain any accelerated approval (in the case of required post-marketing confirmatory studies, if any), and jeopardize our ability to commence product sales and generate revenues. Any of these occurrences may significantly harm our business, prospects, financial condition and results of operations.

Difficulty in enrolling patients or maintaining patient compliance with dosing or other requirements in our clinical trials could delay or prevent clinical trials of our product candidates, which in turn could delay or prevent our ability to obtain, or maintain, the regulatory approvals necessary to commercialize our product candidates.

Identifying and qualifying patients to participate in our ongoing and planned clinical trials of voxelotor, inclacumab, and any other product candidates that we may develop are critical to our success. Our clinical development efforts are initially focused on rare chronic blood diseases. For example, according to CDC estimates, the prevalence of SCD, for which voxelotor is being studied, is approximately 100,000 individuals in the United States. Accordingly, there are limited patient pools from which to draw for clinical trials in our target indications. We may not be able to identify, recruit, and enroll a sufficient number of subjects to complete our clinical trials of voxelotor because of the perceived risks and benefits of voxelotor, the availability of competing therapies and clinical trials, the proximity and availability of clinical trial sites for prospective subjects and the subject referral practices of physicians, among other factors. In addition, we may experience higher than expected patient discontinuations from the group of patients enrolled in the Phase 3 HOPE Study, which would delay or prevent our ability to generate sufficient data to support a potential NDA filing under Subpart H.

Further, if subjects in our clinical trials fail to comply with our dosing regimens or other requirements in our clinical trials, we may not be able to generate clinical data acceptable to the FDA or comparable regulatory authorities in our trials. For example, in our HOPE Study, enrolled participants used a PRO instrument to complete very frequent patient surveys generating data relevant to a secondary endpoint. Because the PRO data were difficult to interpret due to low baseline symptom scores and high inter-subject and intra-subject variability, we do not plan to utilize the PRO as secondary endpoint in Part B of the HOPE Study (under the original study design). If patients are unwilling or unable to participate in, complete or comply with the protocols for our studies for any reason, the timeline for recruiting subjects, conducting studies and obtaining regulatory approval of potential products may be delayed.

If we experience difficulties or delays in enrollment or are otherwise unable to successfully complete any clinical trial of voxelotor, or any other product candidates we may pursue, our costs are likely to increase, and our ability to obtain regulatory approval and generate product revenue from any of these product candidates will be impaired. Any of these occurrences would harm our business, prospects, financial condition and results of operations.

If serious adverse events or unacceptable side effects are identified during the development of our product candidates, we may need to delay, limit or terminate our clinical development activities.

Clinical trials by their nature utilize only a small sample of the potential patient population. For example, our Phase 3 HOPE Study in SCD patients represents only a very small fraction of all patients with SCD. Side effects of voxelotor, inclacumab or any other product candidates that we may develop may be uncovered only in later stages of clinical trials, or only in trials involving different patient populations (such as pediatric patients), or only during post-approval studies or the safety reporting required for approved products. Many product candidates that initially showed promise in early stage testing have later been found to cause side effects that prevented their further development. Moreover, a nonclinical toxicology study with voxelotor in non-humans and clinical trials involving other hemoglobin modifiers (other than voxelotor) have shown a decrease in oxygen delivery to tissue when a significant percentage of hemoglobin is modified. Hemoglobin modifiers, by increasing HbS's affinity for oxygen, can cause a shift in oxygen levels, potentially resulting in tissue hypoxia. To date, clinical studies of voxelotor have not shown evidence of tissue hypoxia. However, if voxelotor or any other product candidates that we may develop are associated with tissue hypoxia or any other undesirable side effects or unexpected undesirable characteristics in clinical trials or nonclinical studies, we may need to abandon their development or limit their development to more narrow uses or subpopulations, which could adversely affect our business, prospects, financial condition and results of operations.

Although the FDA and the European Commission have each granted orphan drug designation for voxelotor for the potential treatment of SCD, we may not receive orphan drug designation for inclacumab or any other product candidates for which we may submit new applications for orphan drug designation, and any orphan drug designations that we have received or may receive in the future may not confer marketing exclusivity or other expected commercial benefits.

Our business strategy focuses on the development of product candidates for the treatment of rare, chronic blood disorders that may be eligible for FDA or European Union, or EU, orphan drug designation. Regulatory authorities in some jurisdictions, including the United States and the EU, may designate drugs for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a drug as an orphan drug if it is intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals annually in the United States. In the EU, the Committee for Orphan Medicinal Products of the EMA recommends orphan drug designation to promote the development of medical products that are intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting not more than five in 10,000 persons in the EU and for which no satisfactory method of diagnosis, prevention, or treatment is authorized (or in other very limited circumstances). In 2015 and 2016, respectively, the FDA and the European Commission (acting on a positive recommendation by the EMA) each granted orphan drug designation for voxelotor for the treatment of patients with SCD.

Generally, if a drug with an orphan drug designation subsequently receives the first marketing approval for the indication for which it has such designation, the drug is entitled to a period of marketing exclusivity, which precludes the FDA or the EMA from approving another marketing application for the same drug for the same indication for that time period. The applicable period is seven years in the United States and 10 years in the EU. The EU exclusivity period can be reduced to six years if a drug no longer meets the

criteria for orphan drug designation or if the drug is sufficiently profitable so that market exclusivity is no longer justified. Orphan drug exclusivity may be lost if the FDA or EMA determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition.

Although the FDA and the EMA have each granted orphan drug designation to voxelotor for the treatment of SCD, we may apply for orphan drug designation for voxelotor in other jurisdictions or for other indications, or for inclacumab or other product candidates we may develop and pursue in the future. Applicable regulatory authorities may not grant us these additional designations. In addition, the exclusivity granted under any orphan drug designations that we have received from the FDA and the EMA, or may receive from any other regulatory authorities (if any), may not effectively protect voxelotor or any other product candidate we pursue from competition because different drugs can be approved for the same condition. For example, in the United States, even after an orphan drug is approved, the FDA can subsequently approve another drug for the same condition if the FDA concludes that the later drug is clinically superior, or the FDA can approve a competitor application for the same drug for a different indication than the orphan drug designation. Any inability to secure or maintain orphan drug designation or the exclusivity benefits of this designation would have an adverse impact on our ability to develop and commercialize our product candidates. In addition, even if any orphan drug designations we receive are maintained, we may be unable to realize significant commercial benefits from these regulatory exclusivities for voxelotor (if approved) or any other product candidate we pursue.

Even if we receive regulatory approval for voxelotor, inclacumab or any other product candidate that we may develop and pursue, we will be subject to ongoing regulatory obligations and scrutiny and may be subject to significant restrictions relating to product labeling, distribution or other post-marketing requirements.

Even if a product candidate such as voxelotor is approved, regulatory authorities may still impose significant restrictions on its indicated uses, approved labeling, distribution or marketing or may impose ongoing requirements for potentially costly post-marketing studies. For example, if we submit an NDA seeking accelerated approval of voxelotor under Subpart H and such accelerated approval is granted, we will be required to conduct post-marketing confirmatory studies to verify the clinical benefit of voxelotor. The FDA may restrict the approved labeling for voxelotor on any accelerated approval in a variety of ways, including with respect to the scope of the approved indication and may require statements of lack of demonstrated benefit (until demonstrated by required post-marketing confirmatory studies) or other restrictions or limitations in any approved product labeling under Subpart H. Furthermore, any new legislation addressing drug safety or other drug related issues could result in delays or increased costs to assure compliance. If voxelotor, inclacumab or any other product candidates that we may develop are approved, at a minimum they will each be subject to current standard ongoing regulatory requirements for labeling, packaging, storage, advertising, promotion, sampling, record-keeping and submission of safety and other post-market information, including both federal and state requirements in the United States. In addition, regulatory agencies may not approve the labeling claims that are necessary or desirable for the successful commercialization of voxelotor, inclacumab or any other product candidates. For example, the development of voxelotor for the prophylactic treatment of SCD in pediatric patients is an important part of our current business strategy, and if we are unable to obtain regulatory approval for this product candidate for the desired age ranges or other key labeling parameters, our business is likely to suffer.

In addition, manufacturers and manufacturers' facilities are required to comply with extensive FDA requirements, including ensuring that quality control and manufacturing procedures conform to current good manufacturing practices, or cGMP's. For voxelotor, inclacumab and any other product candidates we may pursue, we are wholly reliant on third party contract manufacturers for clinical as well as any commercial supplies of product candidates and products. As such, we and our contract manufacturers are subject to continual review and periodic inspections to assess compliance with cGMP requirements and must continue to expend time, money, and effort in all areas of regulatory compliance, including manufacturing, production, and quality control. We will also be required to report certain adverse reactions and production problems, if any, to the FDA and comparable foreign regulatory authorities, and to comply with requirements concerning advertising and promotion for our products. In addition, we are subject to very rapid reporting obligations relating to any adverse events or serious adverse events relating to our product candidates and any approved products, if any. Our failure to report adverse events we become aware of within the prescribed timeframes could have serious negative consequences for our development programs, business and operations. In addition, any promotional communications or materials for prescription drugs are subject to a variety of complex legal and regulatory restrictions, including but not limited to consistency with the approved product's approved label. Failure to obey these standard marketing requirements for any approved product (if any) could have serious negative consequences for our commercialization activities (if any), business and operations.

If the FDA or any comparable foreign regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with a sponsor's activities relating to the promotion, marketing, or labeling of a product, these regulatory agencies may impose restrictions or sanctions on that product or us, including requiring withdrawal of the product from the market. In addition, in the United States, a wide range of commercialization and pre-launch activities relating to a drug candidate are subject to potential for significant civil and/or criminal liability and sanctions under federal anti-kickback and fraud and abuse statutes and regulations. If we fail to comply with any of these complex applicable regulatory requirements, a regulatory agency or enforcement authority may:

- issue untitled or warning letters;
- impose civil or criminal penalties;
- impose injunctions;
- impose fines;
- impose additional specialized restrictions on the company's activities and practices;
- suspend regulatory approval;
- suspend ongoing clinical trials;
- seek voluntary product recalls and impose publicity requirements;
- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our contract manufacturers' facilities; or
- seize or detain products.

As a company, we have no experience with obtaining approval for, launching or commercializing any product candidates or products, or with complying with most of these complex ongoing regulatory requirements. It will take significant effort and management attention to address compliance with these requirements in any jurisdiction for which we seek any product approval. Any government investigation of alleged violations of law could require us to expend significant time and resources in response, and could generate negative publicity even if significant liabilities do not result. Any failure to comply with these complex ongoing regulatory requirements may significantly and adversely affect our ability to obtain approval for, launch, commercialize and generate revenues from voxelotor, inclacumab or any future product candidates. If we are subject to regulatory sanctions or if regulatory approval for our product candidates is withdrawn or limited, our business, prospects, financial condition and results of operations would be significantly harmed.

Risks Related to Our Reliance on Third Parties

We rely, and will continue to rely, on third parties to conduct some of our nonclinical studies and all of our clinical trials and also to perform other tasks for us. If these third parties perform in an unsatisfactory manner, it may harm our business.

We have relied upon and plan to continue to rely upon third-party CROs, including our CROs for our clinical trials of voxelotor, to monitor and manage data for some of our ongoing nonclinical studies and for all of our clinical programs. We rely on these parties for execution of these nonclinical studies and clinical trials, and control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our studies and trials are conducted in accordance with the applicable protocol, legal, regulatory, and scientific standards and our reliance on the CROs does not relieve us of our regulatory responsibilities. We and our CROs and other vendors are required to comply with all applicable cGMPs, GCPs, and current good laboratory practices, or GLPs, which are regulations and guidelines enforced by the FDA, the Competent Authorities of the Member States of the European Economic Area, or EEA, and comparable foreign regulatory authorities. Regulatory authorities enforce these regulations through periodic inspections of study sponsors, principal investigators, study sites, manufacturing facilities, nonclinical testing facilities and other contractors. If we or any of our CROs or other vendors fail to comply with applicable regulations, the data generated in our nonclinical studies and clinical trials may be deemed unreliable and the applicable regulatory authorities may require us to repeat or to perform additional nonclinical and clinical studies before approving our marketing applications, which would delay the regulatory review and approval process, perhaps significantly.

In addition, the execution of nonclinical studies and clinical trials, the subsequent compilation and analysis of the data and results produced, and the supply of test product for our trials, requires coordination among various parties. In order for these functions to be carried out effectively and efficiently, it is imperative that these parties communicate and coordinate with one another. These third parties may terminate their agreements with us upon short notice for our uncured material breach, or under certain other circumstances. If any of our relationships with our third-party CROs or other key vendors (including manufacturing and testing facilities) terminates, we may not be able to enter into arrangements with alternative CROs or other key vendors on a timely basis or at all, or do so on commercially reasonable terms. In addition, our CROs and other key vendors are not our employees, and except for remedies available to us under our agreements with them, we cannot control whether they devote sufficient time and resources to our programs. Furthermore, these third party CROs or other key vendors may also have relationships with other entities, some of which may be our competitors. If CROs or other key vendors do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the data and results they obtain or the test product they

supply is compromised for any reason (including failure to adhere to our protocols, or regulatory requirements), our development activities may be extended, delayed, or terminated and we may not be able to seek or obtain regulatory approval for or successfully commercialize any of our product candidates. Switching or adding CROs or any other key vendors involves additional cost, time and management resources and focus. In addition, our CROs or other key vendors may also generate higher costs than anticipated.

Accordingly, our dependence on third-party CROs and other key vendors may subject us to challenges, delays and costs that have a material adverse impact on our business, prospects, financial condition and results of operations.

We rely entirely on third parties for the manufacturing of voxelotor, inclacumab and for any other product candidates we may pursue for nonclinical studies and clinical trials, and we expect to continue to do so for any product commercialization. Our business could be harmed if any of those third parties fail to provide us with sufficient quantities of drug product, or fail to do so at acceptable quality or quantity levels or prices.

We do not currently have, nor do we plan to acquire, the infrastructure or capability internally to manufacture drug supplies for our ongoing and planned clinical trials of voxelotor or any additional clinical trials that we may conduct for voxelotor, inclacumab or any other future product candidates, and we do not presently expect that we will establish or acquire the resources necessary to manufacture any of our product candidates on a commercial scale. We rely, and expect to continue to rely, wholly on third-party manufacturers to produce our product candidates for our clinical trials, including our HOPE Study, as well as for commercial manufacture or any required post-marketing studies if voxelotor (or any of our product candidates, if any) receives marketing approval. Although we generally do not begin a clinical trial unless we believe we have a sufficient supply of a product candidate to complete the trial, any significant delay or discontinuity in the supply of a product candidate, or the raw material components thereof, for an ongoing clinical trial due to the need to replace a third-party manufacturer could considerably delay the clinical development and potential regulatory approval of our product candidates, which could harm our business and results of operations. We expect to rely on multiple third parties for the manufacture of commercial supplies of voxelotor, inclacumab or any other product candidates, if approved.

We may be unable to establish or maintain any agreements with third-party manufacturers for voxelotor, inclacumab or any other product candidates, or to do so on acceptable terms. Even if we are able to establish or maintain agreements with third-party manufacturers for voxelotor, inclacumab or any other product candidates, reliance on third-party manufacturers entails additional risks, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach or termination of the manufacturing agreement by the third party or by us, including at a time that is costly or inconvenient for us;
- the inability of the third party to satisfy our ordering requirements as to quality, quantity and/or price;
- the possible misappropriation of our proprietary information, including our trade secrets and know-how; and
- the unwillingness of the third party to extend or renew terms with us when desired.

Our reliance on third-party manufacturers in connection with inclacumab will entail additional potential risks. For example, we are transferring technology from Roche to a new third-party manufacturer for inclacumab. The technology transfer for inclacumab must be carefully planned and executed to ensure a successful transition to the new site and approval by the FDA of any investigational new drug application from the new site. This technology transfer may not be successful. In addition, because of our lack of experience manufacturing a biologic product, we will have greater reliance on the expertise and experience of our third-party manufacturer for inclacumab.

Furthermore, all of our contract manufacturers are engaged with other companies to supply and/or manufacture materials or products for such companies, which exposes our manufacturers to regulatory and market risks for the production of such materials and products. As a result, failure to meet the regulatory requirements for the production of those materials and products may affect the regulatory assessment or clearance of our contract manufacturers' facilities generally, and industry consolidation, pricing or other market factors may cause our contract manufacturers to scale back, terminate or refuse to renew desired arrangements for our materials. If the FDA or a comparable foreign regulatory agency finds deficiencies in or does not approve these facilities for the manufacture of our product candidates or if any agency later finds deficiencies or withdraws its approval in the future, we may need to find alternative manufacturing facilities. Any of these factors could negatively impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

Voxelotor, inclacumab and any future product candidates that we may identify and pursue may compete with other product candidates and marketed drugs for access to manufacturing facilities. Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval. Although we currently have adequate supplies to conduct our ongoing clinical trials, if we are unable to enter into relationships with additional contract manufacturers, or our current or future

contract manufacturers cannot perform as agreed, we may experience delays and incur additional costs in our clinical development and potential commercialization activities. Our current and anticipated future dependence upon others for the manufacturing of our product candidates and any marketed drugs may adversely affect our future profit margins and our ability to commercialize any product candidates that receive marketing approval on a timely and competitive basis.

If the contract manufacturing facilities on which we rely do not continue to meet regulatory requirements or are unable to meet our supply demands, our business will be harmed.

All entities involved in the preparation of therapeutics for clinical trials or commercial sale, including our existing contract manufacturers for voxelotor, are subject to extensive regulation. Components of a finished therapeutic product approved for commercial sale or used in late-stage clinical trials must be manufactured in accordance with cGMPs, or similar regulatory requirements outside the United States. These regulations govern manufacturing processes and procedures, including recordkeeping, and the implementation and operation of quality systems to control and assure the quality of investigational products and products approved for sale. Poor control of production processes can lead to the introduction of contaminants or to inadvertent changes in the properties or stability of our product candidates. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, license revocation, suspension of production, seizures or voluntary recalls of product candidates or marketed drugs, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect clinical or commercial supplies of voxelotor, inclacumab or any of our future product candidates.

Among other requirements, we or our contract manufacturers must supply all necessary documentation in support of an NDA or MAA seeking approval of a product candidate on a timely basis and must adhere to GLP and cGMP regulations enforced by the FDA and other regulatory agencies through their facilities inspection programs. Some of our contract manufacturers for voxelotor have never produced a commercially approved pharmaceutical product and therefore have not obtained the requisite regulatory authority pre-approval inspection or approvals to do so. The facilities and quality systems of some or all of our third-party contractors must pass a pre-approval inspection for compliance with the applicable regulations as a condition of regulatory approval for voxelotor. In addition, the regulatory authorities may, at any time, audit or inspect a manufacturing facility involved with the preparation of voxelotor, inclacumab or any of our future product candidates or the associated quality systems. Although we oversee the contract manufacturers, we cannot control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with these complex regulatory requirements. If these manufacturers, facilities, records or systems do not pass pre-approval inspections and reviews, regulatory approval of voxelotor, inclacumab or any of our other future product candidates may never be granted or may be substantially delayed.

In addition, at any time following approval of a product for sale, the regulatory authorities also may audit the manufacturing facilities of our third-party contractors. If any such inspection or audit identifies a failure to comply with applicable regulations or if a violation of our product specifications or applicable regulations occurs independent of such an inspection or audit, we or the relevant regulatory authority may require remedial measures that could be costly and/or time consuming for us or a third party to implement, and that may include the temporary or permanent suspension of a clinical study or commercial sales or the temporary or permanent closure of a facility. Any such remedial measures imposed upon us or third parties with whom we contract could materially harm our business.

Additionally, if supply from one approved manufacturer is interrupted, an alternative manufacturer would need to be qualified through a supplement to an NDA, MAA variation or equivalent foreign regulatory filing, which could result in further delay, uncertainty and costs. Regulatory agencies may also require additional clinical studies if a new manufacturer is relied upon for commercial production. Switching manufacturers may involve substantial costs and is likely to result in a delay in our programs, results and activities (including commercial timelines).

These factors could cause us to incur higher costs and could cause the delay or termination of clinical trials, regulatory submissions, required approvals, or commercialization of our product candidates. Furthermore, if our suppliers fail to meet contractual requirements and we are unable to secure one or more replacement suppliers capable of production at a substantially equivalent cost, our clinical trials may be delayed or we could lose potential revenue.

Our reliance on third parties requires us to share our trade secrets and confidential information, which increases the possibility that a competitor will discover them or that our critical information will be misappropriated or disclosed.

Because we rely on third parties to manufacture voxelotor and to conduct other aspects of our clinical development activities, as well as for inclacumab and any other product candidates we may pursue, we must, at times, share trade secrets with them. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, other forms of agreement with any collaborators, CROs, manufacturers and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information. Despite the contractual

provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets and confidential information may become known by our competitors, may inadvertently be incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or confidential information, or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

Our agreements typically restrict the ability of certain collaborators, CROs, manufacturers, other key vendors and consultants to publish data, although many of our contracts provide for the right to publish data in specified circumstances. A significant breach of these publication provisions could impair our competitive position. In addition, we conduct joint research and development programs that may require us to share trade secrets and other confidential information. Despite our efforts to protect our trade secrets and confidential information, our competitors may discover them, either through breach of agreements relating to these programs, independent development or publication of information where we do not have proprietary or otherwise protected rights at the time of publication. A competitor's discovery of our trade secrets or confidential information would impair our competitive position and have an adverse impact on our business.

Risks Related to Our Intellectual Property

If we or our licensors are unable to obtain and maintain sufficient intellectual property protection for our product candidates, or if the scope of the intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize product candidates similar or identical to ours, and our ability to successfully commercialize voxelotor, inclacumab and other product candidates that we may pursue may be impaired. Changes in patent policy and rules could impair our ability to protect our products and increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

As is the case with other biopharmaceutical companies, our success depends in large part on our ability to obtain and maintain protection of the intellectual property, particularly patents, that we may exclusively license or own solely and jointly with others in the United States and other countries with respect to our product candidates and technology, including voxelotor and inclacumab. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our product candidates.

Obtaining and enforcing biopharmaceutical patents is costly, time consuming, uncertain and complex, and we or our licensors may not be able to file and prosecute all necessary or desirable patent applications, or maintain, enforce and license any patents that may issue from such 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. We may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the rights to patents licensed to third parties. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. If our current or future licensors, licensees or collaboration partners fail to establish, maintain or protect such patents and other intellectual property rights, such rights may be reduced or eliminated. If our licensors, licensees or collaboration partners are not fully cooperative or disagree with us as to the prosecution, maintenance or enforcement of any patent rights, such patent rights could be compromised.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal, technological and factual questions and has in recent years been the subject of much litigation. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States, or vice versa. Further, we may not be aware of all third-party intellectual property rights potentially relating to our product candidates. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing or, in some cases, not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file for patent protection of such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are and will remain highly uncertain. The patent examination process may require us or our licensors, licensees or collaboration partners to narrow the scope of the claims of our or our licensors', licensees' or collaboration partners' pending and future patent applications, which may limit the scope of patent protection that may be obtained. Our pending and future patent applications may not result in patents being issued that protect voxelotor, inclacumab or any future product candidates, in whole or in part, or which effectively prevent others from commercializing competitive product candidates. Even if our patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our patents by developing similar or alternative product candidates in a non-infringing manner, or by successfully seeking to narrow or invalidate our patents or render them unenforceable. Our and our licensors', licensees' or collaboration partners' patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications, and then only to the extent the issued claims cover the technology.

We cannot assure you that all of the potentially relevant prior art relating to our patents and patent applications has been found. If such prior art exists, it can invalidate a patent or prevent a patent from issuing from a pending patent application. Moreover, we may be subject to a third-party preissuance submission of prior art to the United States Patent and Trademark Office (the "USPTO"), or become involved in opposition, derivation, reexamination, *inter partes* review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our product candidates and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize drugs without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize voxelotor, inclacumab or any future product candidates.

In addition, the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical product candidates, or limit the duration of the patent protection of our product candidates. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing drugs similar or identical to ours.

The United States has enacted and is currently implementing wide-ranging patent reform legislation. The United States Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents once obtained. Depending on future actions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would diminish the value of our patents and patent applications or narrow the scope of our patent protection, or weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

Assuming the other requirements for patentability are met, in the United States prior to March 15, 2013, the first to make the claimed invention is entitled to the patent, while outside the United States, the first to file a patent application is entitled to the patent. After March 15, 2013, under the Leahy-Smith America Invents Act (the "AIA"), enacted in 2011, the United States has moved to a first to file system similar to other countries' systems. The AIA also includes a number of significant changes that affect the way patent applications are prosecuted, and may also affect patent litigation. The effects of these changes are currently unclear as the USPTO must still implement various regulations, the courts have yet to address certain of these provisions and the applicability of the AIA and new regulations remain to be issued. Accordingly, it is not clear what, if any, impact the AIA will have on the operation of our business. However, the AIA and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of patents that may issue from such patent applications, all of which could have a material adverse effect on our business and financial condition. Any further changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents and patent applications or narrow the scope of our potential patent protection.

We may become subject to claims alleging infringement of third parties' patents or proprietary rights and/or claims seeking to invalidate our patents, which would be costly, time consuming and, if successfully asserted against us, delay or prevent the development and commercialization of voxelotor, inclacumab or any future product candidates that we may develop.

We cannot assure that voxelotor, inclacumab or any future product candidates that we may develop will not infringe existing or future third-party patents. Because patent applications can take many years to issue and may be confidential for 18 months or more after filing, there may be applications now pending of which we are unaware and which may later result in issued patents that we may infringe by commercializing voxelotor or any future product candidates that we may develop. We may additionally be unaware of one or more issued patents that would be infringed by the manufacture, sale or use of voxelotor, inclacumab or any of our other product candidates.

We may in the future become party to, or be threatened with, adversarial proceedings or litigation against us regarding third party intellectual property rights with respect to voxelotor, inclacumab or our future product candidates, that would cause us to incur substantial expenses and, if successful against us, could cause us to pay substantial damages, including treble damages and attorneys' fees if we are found to be willfully infringing a third party's patents. We may also be required to indemnify parties with whom we have contractual relationships against such claims. If a patent infringement suit were brought against us, we could be forced to stop or delay research, development, manufacturing or sales of the product or product candidate that is the subject of the suit. As a result of

patent infringement claims, or in order to avoid potential claims, we may choose to seek, or be required to seek, a license from the third party to continue developing, manufacturing and marketing our product candidates and would most likely be required to pay license fees or royalties or both, that could be significant. These licenses may not be available on acceptable terms, or at all. Even if we were able to obtain a license, the rights may be nonexclusive, which would give our competitors access to the same intellectual property licensed to us. Ultimately, we could be prevented from commercializing a product, or forced to redesign it, or to cease some aspect of our business operations if, as a result of actual or threatened patent infringement claims, we are unable to enter into licenses on acceptable terms. Even if we are successful in defending against such claims, such litigation can be expensive, uncertain, and time consuming to litigate, and would divert management's attention from our core business. Any of these events could harm our business significantly.

In addition to infringement claims against us, if third parties prepare and file patent applications in the United States that also claim technology similar or identical to ours, we may have to participate in interference or derivation proceedings in the USPTO, to determine which party is entitled to a patent on the disputed invention. We may also become involved in similar opposition proceedings in the European Patent Office or similar offices in other jurisdictions regarding our intellectual property rights with respect to our product candidates and technology.

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

Competitors or other parties may infringe our patents or other intellectual property. Although we are not currently involved in any litigation, if we were to initiate legal proceedings against a third party to enforce a patent covering one of our product candidates, the defendant could counterclaim that the patent covering our product candidate is invalid and/or unenforceable. In addition, there is an abbreviated regulatory pathway, under the Biologics Price Competition and Innovation Act of 2009, for the regulatory approval of biosimilar or interchangeable biologic products, which could create a litigation pathway for a third party to challenge patents covering inclacumab. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace, and there are multiple potential grounds for a validity challenge or an unenforceability assertion. The outcome following legal assertions of invalidity and unenforceability is often highly unpredictable.

Interference or derivation proceedings provoked by third parties or brought by us or declared by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms.

In addition, our defense of litigation, interference or derivation proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. In addition, the uncertainties associated with litigation could have a material adverse effect on our business and operations including our ability to raise the funds necessary to continue our clinical trials, continue our research programs, license necessary technology from third parties, or enter into development partnerships that would help us bring our product candidates to market.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions, or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

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

We may be subject to claims that former employees, collaborators or other third parties have an interest in our patents or other intellectual property as an inventor or co-inventor. For example, inventorship disputes may arise from conflicting obligations of third parties involved in developing our product candidates or as a result of questions regarding co-ownership of potential joint inventions. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership or we may enter into agreements to clarify the scope of our rights in such intellectual property. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on our business and operations including our ability to raise the funds necessary to continue our clinical trials, continue our research programs, license necessary technology from third parties, or enter into development partnerships that would help us bring our product candidates to market. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

We jointly own patents and patent applications with third parties. Our ability to exploit or enforce these patent rights, or to prevent the third party from granting licenses to others with respect to these patent rights, may be limited in some circumstances.

We jointly own certain patents and patent applications with third parties. In the absence of an agreement with each co-owner of jointly owned patent rights, we will be subject to default rules pertaining to joint ownership. Some countries require the consent of all joint owners to exploit, license or assign jointly owned patents, and if we are unable to obtain that consent from the joint owners, we may be unable to exploit the invention or to license or assign our rights under these patents and patent applications in those countries. For example, we have exclusively licensed from the Regents of the University of California (the "Regents"), worldwide patent rights covering voxelotor and certain voxelotor analogs, some of which patent rights we jointly own with the Regents. Additionally, in the United States, each co-owner may be required to be joined as a party to any claim or action we may wish to bring to enforce these patent rights, which may limit our ability to pursue third party infringement claims.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties or that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

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

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

We seek to protect our confidential proprietary information, in part, by confidentiality agreements and invention assignment agreements with our employees, consultants, scientific advisors, contractors and collaborators. These agreements are designed to protect our proprietary information. However, we cannot be certain that such agreements have been entered into with all relevant parties, and we cannot be certain that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. For example, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. We also seek to preserve the integrity and confidentiality of our confidential proprietary information by maintaining physical security of our premises and physical and electronic security of our information technology systems, but it is possible that these security measures could be breached. Enforcing a claim that a third party obtained illegally and is using trade secrets or confidential know-how is expensive, time consuming and unpredictable. The enforceability of confidentiality agreements may vary from jurisdiction to jurisdiction. If any of our confidential proprietary information were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position. Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret.

Failure to obtain or maintain trade secrets or confidential know-how trade protection could adversely affect our competitive position. Moreover, our competitors may independently develop substantially equivalent proprietary information and may even apply for patent protection in respect of the same. If successful in obtaining such patent protection, our competitors could limit our use of our trade secrets or confidential know-how.

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

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We employ outside firms and rely on them to pay many of these fees. The USPTO and various non-U.S. governmental patent agencies require compliance with a number of complex procedural, documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market, with a material adverse effect on our business.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries worldwide, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and may also export infringing products to territories where we have patent protection but patent enforcement is not strong. These products may compete with our products and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

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

Changes in patent laws or patent jurisprudence could diminish the value of patents in general, thereby impairing our ability to protect our products.

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve both technological complexity and legal complexity. Therefore, obtaining and enforcing biopharmaceutical patents is costly, time-consuming and inherently uncertain. In addition, the AIA has been recently enacted in the United States, resulting in significant changes to the U.S. patent system.

An important change introduced by the AIA is that, as of March 16, 2013, the United States transitioned to a “first-to-file” system for deciding which party should be granted a patent when two or more patent applications are filed by different parties claiming the same invention. A third party that files a patent application in the USPTO after that date but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by the third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application, but circumstances could prevent us from promptly filing patent applications on our inventions.

Among some of the other changes introduced by the AIA are changes that limit where a patentee may file a patent infringement suit and provide opportunities for third parties to challenge any issued patent in the USPTO. This applies to all of our U.S. patents, even those issued before March 16, 2013. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. The AIA and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents.

The USPTO recently has developed regulations and procedures to govern administration of the AIA, and many of the substantive changes to patent law associated with the AIA, and, in particular, the first to file provisions, only became effective on March 16, 2013. Accordingly, the courts have yet to address many of these provisions and it is not clear what, if any, impact the AIA will have on the operation of our business. The AIA and its implementation could increase the uncertainties and costs surrounding the prosecution of our or our licensors’ or collaboration partners’ patent applications and the enforcement or defense of our or our licensors’ or collaboration partners’ issued patents, all of which could have an adverse effect on our business and financial condition.

Additionally, the U.S. Supreme Court has ruled on several patent cases in recent years narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this has also contributed to uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that could weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. Similarly, the complexity and uncertainty of European patent laws has also increased in recent years. In addition, the European patent system is relatively stringent in the type of amendments that are allowed during prosecution. These changes could limit our ability to obtain new patents in the future that may be important for our business.

Risks Related to Commercialization

Even if voxelotor, inclacumab or any other product candidate that we may develop receives marketing approval, commercial success will depend upon the degree of market acceptance by physicians, patients, third-party payors and others in the medical community and marketplace.

If voxelotor, inclacumab or any other product candidates that we may pursue receives marketing approval, including any approval by the FDA under Subpart H, the product may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community and marketplace. If any approved product does not achieve an adequate level of acceptance, we may not generate significant revenue from drug sales and we may not become profitable. Before granting reimbursement approval, healthcare payors may require us to demonstrate that our product candidates, in addition to treating the target indication, also provide incremental health benefits to patients. For example, there have been numerous instances of government and private payors placing restrictions on coverage for products approved by the FDA under Subpart H, so even if voxelotor were to receive accelerated approval from the FDA, healthcare payors may place restrictions on coverage for voxelotor. Our efforts to educate the medical community and third-party payors about the benefits of our product candidates may require significant resources and may never be successful. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a wide range of factors, including:

- the demonstrated efficacy and potential advantages of our drugs compared to alternative treatments;
- our ability to offer our drugs for sale at competitive prices;
- the convenience and ease of administration of our drugs compared to alternative current and future treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the availability of drugs and their ability to meet market demand, including a reliable supply for long-term chronic treatment;
- the strength of marketing and distribution support;
- the availability of third-party coverage and adequate reimbursement;
- the clinical indications and approved labeling, including any labeling restrictions in the event a product candidate is approved under Subpart H, for which the drug is approved;
- the prevalence and severity of any side effects and overall safety profile of the drug; and
- any restrictions on the use of the drug, including together with other medications.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to market and sell our product candidates, we may be unsuccessful in commercializing our product candidates if approved by regulatory authorities.

Although some of our employees have experience with commercializing products while employed at other companies, as a company we have no experience selling and marketing our product candidates, as a management team we have not commercialized any product candidates, and we currently have no sales organization. To successfully commercialize any products that may result from our development programs, we will need to develop commercial capabilities, either on our own or with others. If our product candidates receive regulatory approval, we intend to establish a sales and marketing organization with technical expertise and supporting distribution capabilities to commercialize our product candidates in major markets, which will be expensive, difficult, risky and time consuming. Any failure or delay in the development of our internal sales, marketing, and distribution capabilities would adversely impact the commercialization of our products, if any are approved.

Further, given our lack of prior experience in marketing and selling biopharmaceutical products, our initial estimate of the size of the required sales force may be materially more or less than the size of the sales force actually required to effectively commercialize our product candidates. As such, we may be required to hire substantially more sales representatives to adequately support the commercialization of our product candidates or we may incur excess costs as a result of hiring more sales representatives than

necessary. With respect to certain geographical markets, we may enter into collaborations with other entities to utilize their local marketing and distribution capabilities, but we may be unable to enter into such agreements on favorable terms, if at all. If our future collaborators do not commit sufficient resources to commercialize our future products, if any, and we are unable to develop the necessary marketing capabilities on our own, we will be unable to generate sufficient product revenue to sustain our business. We may be competing with companies that currently have extensive and well-funded marketing and sales operations. Without an internal team or the support of a third party to perform marketing and sales functions, we would be unable to compete successfully against more established companies.

The insurance coverage and reimbursement status of newly-approved products is uncertain. Failure to obtain or maintain adequate coverage and reimbursement for new or current products could limit our ability to market those products and decrease our ability to generate revenue.

Our target patient populations are small, and accordingly the pricing, coverage and reimbursement of our product candidates, if approved, must be adequate to support our commercial infrastructure. Our per-patient prices must be sufficient to recover our development and manufacturing costs and potentially achieve profitability. Accordingly, the availability of government funded or private insurance coverage for our product candidates for any approved indications, and the extent of reimbursement by governmental and private payors, will be essential for most patients to be able to afford expensive treatments, such as we expect ours to be assuming approval. Sales of our product candidates will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by third party payors, like private health insurers, including health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, and government health administration programs, like Medicare and Medicaid. If reimbursement is not available, or is available only to limited levels, we may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish or maintain pricing sufficient to realize a sufficient return on our investment.

There is significant uncertainty related to the insurance coverage and reimbursement of newly approved drug products, and even more uncertainty related to the insurance coverage for products that receive accelerated approval by the FDA under Subpart H (including in the period before required post-marketing confirmatory studies to verify clinical benefit). The process for determining whether a third-party payor will provide coverage for a product may be separate from the process for setting the reimbursement rate that the payor will pay for the product. Third-party payors may limit coverage to specific products on an approved list, or formulary, which might not include all of the FDA-approved products for a particular indication. Moreover, a third-party payor’s decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. For example, the payor’s reimbursement payment rate may not be adequate or may require co-payments that patients find unacceptably high. Additionally, coverage and reimbursement for products can differ significantly from payor to payor.

In the United States, significant decisions about reimbursement for new medicines are made by the Centers for Medicare & Medicaid Services, or CMS, an agency within the U.S. Department of Health and Human Services, as CMS decides whether and to what extent a new medicine will be covered and reimbursed under Medicare and enters into contracts with drug manufacturers for discounted drug prices for Medicaid under the Medicaid Drug Rebate Program. The practices and requirements relating to the payment of rebates by drug manufacturers for Medicaid purchases are determined by each state, and in some cases, if a company does not enter into a rebate agreement, its Medicaid sales will be subjected to a “prior authorization” procedure that requires state agency approval to qualify a doctor’s prescription for reimbursement. Limitations could also come from entities such as local Medicare carriers, fiscal intermediaries, or Medicare Administrative Contractors. Further, Medicare Part D, which provides a pharmacy benefit to certain Medicare patients, does not require participating prescription drug plans to cover all drugs within a class of products. Our business could be materially adversely affected if private or governmental payors, including Medicare Part D prescription drug plans, were to limit access to, or deny or limit reimbursement of, our product candidates.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe, Canada, and other countries has and will continue to put pressure on the pricing and usage of our product candidates. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems, and changes to these regulations over time contribute to uncertainty regarding the ability to obtain pricing and usage approvals for our product candidates outside of the United States. In general, the prices of medicines under such systems are substantially lower than in the United States. Other countries allow companies to fix their own prices for medicines, but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our product candidates. Accordingly, in markets outside the United States, the reimbursement for our products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenues and profits.

In many non-U.S. jurisdictions, the proposed pricing for a drug must be approved before it may be lawfully marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted and reimbursement may in some cases be unavailable. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay commercial launch of the product, possibly for lengthy time periods, which may negatively impact the revenues we are able to generate from the sale of the product in that country. The requirements governing drug pricing vary widely from country to country and products may be subject to continuing governmental control following approval. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use, including by approving a specific price for the medicinal product or adopting a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products or product candidates.

Moreover, increasing efforts by governmental and third-party payors, in the United States and abroad, to cap or reduce healthcare costs may cause such organizations to limit both coverage and levels of reimbursement for new products approved and, as a result, they may not cover or provide adequate payment for our product candidates. We expect to experience pricing pressures in connection with the sale of any of our product candidates, due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative and political changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. For example, third-party payors are increasingly requiring higher levels of evidence of the benefits and clinical outcomes of new technologies, benchmarking against other therapies, seeking performance-based discounts, and challenging the prices charged. We cannot be sure that coverage will be available for any product we commercialize and, if available, that the reimbursement rates will be adequate. As a result, increasingly high barriers are being erected to the entry of new products. In addition, drug prices are under significant scrutiny in the markets in which our products may be sold, and drug pricing and other healthcare costs continue to be subject to intense political and social pressures which we anticipate will continue and escalate on a global basis. As a result, our business and reputation may be harmed, our stock price may be adversely impacted and experience periods of volatility, we may have difficulty raising funds and our results of operations may be adversely impacted.

In light of the large population of patients with SCD who reside in foreign countries, our ability to generate meaningful revenues in those jurisdictions may be limited due to the strict price controls and reimbursement limitations imposed by governments outside of the United States.

In some countries, particularly in the European Union, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a drug. To obtain coverage and reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidate to other available therapies, or to meet other criteria for pricing approval.

Reimbursement systems in international markets vary significantly by country and by region. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. For example, reimbursement in the European Union must be negotiated on a country-by-country basis and in many countries, the product cannot be commercially launched until reimbursement is approved. The negotiation process in some countries can be very lengthy. To obtain reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our products to other available therapies.

In addition, pricing regulations outside of the United States vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products or product candidates. If reimbursement of our product candidates is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business and operations could be harmed, possibly materially, based on the large population of patients with SCD who reside in foreign countries.

Our future profitability will depend, in part, on our ability to commercialize our product candidates in markets within and outside of the United States and Europe. If we commercialize our product candidates in foreign markets, we would be subject to additional risks and uncertainties, including:

- the burden of complying with complex and changing foreign regulatory, tax, accounting, compliance and legal requirements;
- different medical practices and customs in foreign countries affecting acceptance in the marketplace;
- import or export licensing requirements;
- longer accounts receivable collection times;

- longer lead times for shipping;
- language barriers for technical training;
- reduced protection of intellectual property rights in some foreign countries, and related prevalence of bioequivalent or generic alternatives to therapeutics;
- foreign currency exchange rate fluctuations;
- patients' ability to obtain reimbursement for our products in foreign markets; and
- the interpretation of contractual provisions governed by foreign laws in the event of a contract dispute.

Our business operations and current and future relationships with investigators, health care professionals, consultants, third-party payors and customers will be subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws, health information privacy and security laws, and other healthcare laws and regulations. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties.

Although we do not currently have any products on the market, our current and future operations may be directly, or indirectly through our prescribers, customers and third-party payors, subject to various U.S. federal and state healthcare laws and regulations. These laws may impact, among other things, our current business operations, including our clinical research activities, and proposed sales, marketing and education programs and constrain our business and financial arrangements and relationships with healthcare providers, physicians and other parties through which we market, sell and distribute our products for which we obtain marketing approval. We may also be subject to additional healthcare, statutory and regulatory requirements and enforcement by foreign regulatory authorities in jurisdictions in which we conduct our business. The laws that may affect our ability to operate include the federal Anti-Kickback Statute, the federal False Claims laws, HIPAA, the Physician Payment Sunshine Act, and analogous state laws and regulations such as state anti-kickback and false claims laws and analogous non-U.S. fraud and abuse laws and regulations, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including the following:

- the U.S. federal Anti-Kickback Statute makes it illegal for any person, including a prescription drug manufacturer (or a party on its behalf) to knowingly and willfully solicit, offer, receive or pay any remuneration (including any kickback, bribe, or certain rebates), directly or indirectly, overtly or covertly, in cash or in kind, that is intended to induce or reward either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service, for which payment may be made, in whole or in part, under U.S. federal healthcare programs such as Medicare and Medicaid. Violations of this law can result in criminal penalties and fines, administrative civil money penalties and exclusion from participation in federal healthcare programs. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation, and some federal courts have adopted very broad readings of the potential for violations of the statute;
- the U.S. federal false claims and civil monetary penalties laws, including the civil False Claims Act, which, among other things, impose criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities (including manufacturers) knowingly presenting, or causing to be presented false or fraudulent claims for payment by a federal healthcare program or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government. Penalties for a False Claims Act violation include three times the actual damages sustained by the government, plus mandatory civil penalties, the potential for exclusion from participation in federal healthcare programs and the potential implication of various federal criminal statutes. The government may deem manufacturers to have "caused" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. Claims which include items or services resulting from a violation of the federal Anti-Kickback Statute are false or fraudulent claims for purposes of the False Claims Act, and activities relating to the reporting of wholesaler or estimated retail prices, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party product reimbursement are subject to scrutiny under this law. The civil False Claims Act has been used to assert liability on the basis of, among other things, kickbacks and other improper referrals, improperly reported government pricing metrics such as Best Price or Average Manufacturer Price causing underpayment of rebates, improper use of Medicare provider or supplier numbers when detailing a provider of services, improper promotion (e.g. of off-label uses not expressly approved by the FDA in a product's label), and allegations as to misrepresentations with respect to the services rendered. Intent to deceive is not required to establish liability under the civil False Claims Act. Over time, False Claims Act lawsuits against biopharmaceutical companies have increased significantly in volume and breadth, leading to multiple substantial civil and criminal settlements regarding sales practices and promoting off label uses. Further, the government may further prosecute conduct constituting a false claim under the criminal False Claims Act;

- the U.S. federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services; similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and their respective implementing regulations, which imposes, among other things, specified requirements on covered entities and their business associates relating to the privacy, security and transmission of individually identifiable health information, including mandatory contractual terms and required implementation of technical safeguards of such information. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties applicable to business associates, and gave state attorneys general new authority to file civil actions for damage or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions;
- the U.S. Federal Food, Drug and Cosmetic Act, which prohibits, among other things, the adulteration or misbranding of drugs, biologics and medical devices;
- the U.S. federal legislation commonly referred to as Physician Payments Sunshine Act, enacted as part of the ACA, as amended by the Education Reconciliation Act of 2010 and its implementing regulations, which requires certain manufacturers of drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid, or the Children's Health Insurance Program to report annually to the CMS information related to certain payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members;
- payment or reimbursement of prescription therapeutics by Medicaid or Medicare requires manufacturers to submit pricing information to CMS. The Medicaid Drug Rebate statute requires manufacturers to calculate and report price points, which are used to determine Medicaid rebate payments shared between the states and the federal government and Medicaid payment rates for certain therapeutics. For therapeutics paid under Medicare Part B, manufacturers must also calculate and report their Average Sales Price, which is used to determine the Medicare Part B payment rate. Many products are subject to an additional inflation penalty which can substantially increase rebate payments. In addition, the Veterans Health Care Act, or VHCA, requires manufacturers of drugs and biologics to calculate and report a different price to the Veterans Administration, or VA, which is used to determine the maximum price that can be charged to certain federal agencies, and includes an inflation penalty. All of these detailed and complex price reporting requirements create risk of submitting false information to the government, and potential for liability including under the False Claims Act;
- the VHCA also requires manufacturers of covered therapeutics participating in the Medicaid program to enter into Federal Supply Schedule contracts with the VA through which their covered therapeutics must be sold to certain federal agencies at the price reported to the VA. This necessitates compliance with applicable federal procurement laws and regulations, including submission of commercial sales and pricing information, and subjects manufacturers to contractual remedies as well as administrative, civil, and criminal sanctions. In addition, the VHCA requires manufacturers participating in Medicaid to agree to provide different mandatory discounts to certain Public Health Service grantees and other safety net hospitals and clinics under the 340B program based on the manufacturer's reported Medicaid pricing information. The 340B program has its own regulatory authority to impose sanctions for non-compliance;
- analogous state laws and regulations, including: state anti-kickback and false claims laws, which may be broader in scope and apply regardless of payor; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which requires tracking gifts and other remuneration and items of value provided to healthcare professionals and entities; and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts;
- the Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering, or authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party, or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations. Activities that violate the FCPA, even if they occur wholly outside the United States, can result in criminal and civil fines, imprisonment, disgorgement, oversight, and debarment from government contracts; and

- European and other foreign law equivalents of each of the laws, including reporting requirements detailing interactions with and payments to healthcare providers.

Ensuring that our business arrangements with third parties comply with applicable healthcare laws and regulations is complex and could be costly. It is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations or case law involving applicable fraud and abuse, price reporting or other healthcare laws and regulations. If our operations were found to be in violation of any of these requirements that may apply to us, we may be subject to significant civil, criminal, and administrative penalties, damages, fines, disgorgement, individual imprisonment, debarment from governmental contracting and refusal of orders under existing contracts, and exclusion from government funded healthcare programs, such as Medicare and Medicaid, any of which could substantially disrupt our business and operations. If the physicians or other providers or entities with whom we expect to do business are found not to be in compliance with applicable requirements, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

Although an effective compliance program can mitigate the risk of investigation and prosecution for violations of these requirements, the risks cannot be entirely eliminated. Moreover, achieving and sustaining compliance with applicable federal and state privacy, security, and fraud requirements may prove costly. Any action against us for violation of these requirements, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from our business and operation, and could negatively impact the price of our common stock.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform and other factors, including the lack of applicable precedent and regulations. Federal and state enforcement bodies regularly pursue a large number of investigations, prosecutions, convictions and settlements in the healthcare industry. Ensuring that our internal operations and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion of products or individuals from U.S. government funded healthcare programs, such as Medicare and Medicaid, or similar programs in other countries or jurisdictions, disgorgement, individual imprisonment, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, contractual damages, reputational harm, diminished profits, and the curtailment or restructuring of our operations. Further, defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired. If any of the physicians or other providers or entities with whom we expect to do business is found to not be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs and imprisonment. If any of the above occur, it could adversely affect our ability to operate our business and our results of operations.

Healthcare legislative reform measures may have a material adverse effect on our business and results of operations.

In the United States, there have been and continue to be a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our drug candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any drug candidates for which we obtain marketing approval. For example, in 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or the Affordable Care Act, (the "ACA"), was passed, which substantially changes the way health care is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The provisions of the ACA of importance to the pharmaceutical and biotechnology industry are, among others, the following:

- an annual, nondeductible fee on any entity that manufactures or imports certain branded prescription drugs and biologic agents, which is apportioned among these entities according to their market share in certain government healthcare programs;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13% of the average manufacturer price for branded and generic drugs, respectively;

- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts to negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations, unless the drug is subject to discounts under the 340B drug discount program;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- expansion of healthcare fraud and abuse laws, including the False Claims Act and the Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;
- new requirements under the federal Physician Payments Sunshine Act for drug manufacturers to report information related to payments and other transfers of value made to physicians and teaching hospitals as well as ownership or investment interests held by physicians and their immediate family members;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- establishment of a Center for Medicare and Medicaid Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending; and
- aggregate reductions to Medicare Part B payments to providers of up to 2% per fiscal year, which became effective on April 1, 2013 and will remain in effect through 2027 unless additional congressional action is taken.

Since its enactment, there have been many judicial, President, and Congressional challenges to numerous aspects of the ACA. In 2012, the U.S. Supreme Court heard challenges to the constitutionality of the individual mandate and the viability of certain provisions of the Healthcare Reform Act. The Supreme Court's decision upheld most of the Healthcare Reform Act and determined that requiring individuals to maintain "minimum essential" health insurance coverage or pay a penalty to the Internal Revenue Service was within Congress's constitutional taxing authority. However, as a result of tax reform legislation passed in late December 2017, the individual mandate has been eliminated. The long ranging effects of the elimination of the individual mandate on the viability of the ACA are unknown at this time.

In addition, in January 2017, President Trump signed executive orders directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal burden on states or a cost, fee, tax, penalty or regulatory burden on individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices, and terminated the cost-sharing subsidies that reimburse insurers under the ACA. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California in October 2017. In addition, CMS has recently proposed regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the ACA for plans sold through such marketplaces. The full impact of the ACA, any law repealing and/or replacing elements of it, and the political uncertainty surrounding any repeal or replacement legislation on our business remains unclear.

Additionally, at the federal level, statutes and regulations routinely impact a variety of parameters relating to federal programs and Medicaid. For example, CMS's final rule regarding the Medicaid drug rebate program, issued in 2016, revised the manner in which the ''average manufacturer price'' is to be calculated by manufacturers participating in the program. At the state level, legislatures are increasingly passing legislation and implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. The full impact of these federal and state laws and regulations, as well as other new laws and reform measures that may be proposed and adopted in the future, remains uncertain, but may result in additional reductions in Medicaid and other health care funding, or higher production costs which could have a material adverse effect on our customers and, accordingly, our financial operations.

There have been several recent U.S. congressional inquiries and proposed and adopted federal and state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs and biologics. In addition, Congress and the

Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. While any proposed measures will require authorization through additional legislation to become effective, Congress and the current U.S. presidential administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs.

At the state level, legislatures are increasingly passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional health care authorities are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other health care programs. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing.

Moreover, there have been a number of other legislative and regulatory changes in recent years aimed at the biopharmaceutical industry. For instance, the Drug Quality and Security Act imposes obligations on manufacturers of biopharmaceutical products related to product tracking and tracing. Among the requirements of this legislation, manufacturers are required to provide certain information regarding the product to individuals and entities to which product ownership is transferred, will be required to label products with a product identifier, and are required keep certain records regarding the product. The transfer of information to subsequent product owners by manufacturers will eventually be required to be done electronically. Manufacturers are also required to verify that purchasers of the manufacturers' products are appropriately licensed. Further, manufacturers have product investigation, quarantine, disposition, and FDA and trading partner notification responsibilities related to counterfeit, diverted, stolen, and intentionally adulterated products that would result in serious adverse health consequences or death to humans, as well as products that are the subject of fraudulent transactions or which are otherwise unfit for distribution such that they would be reasonably likely to result in serious health consequences or death.

We expect federal and state healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria, increased regulatory burdens and operating costs, decreased net revenue from our pharmaceutical products and additional downward pressure on the price that we receive if voxelotor is approved for use. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our products. These legislative and executive efforts have significantly increased uncertainty regarding the availability of healthcare programs, insurance coverage and reimbursement as a general matter as well as for our product candidates, and we cannot predict how these events will impact our business or operations. Accordingly, at this time it is difficult to determine the full impact of these efforts on our business. In the United States many patients with SCD participate in the Medicaid program, and the impact of uncertainty or changes relating to the ACA or healthcare programs, insurance coverage or reimbursement generally could be particularly significant for our SCD program if voxelotor is approved for use.

We face intense competition and rapid technological change and the possibility that our competitors may develop therapies that are similar, more advanced, or more effective than ours, which may adversely affect our financial condition and our ability to successfully commercialize our product candidates.

The biotechnology and pharmaceutical industries are intensely competitive and subject to rapid and significant technological change. We are currently aware of various existing therapies and development candidates that may compete with voxelotor and inclacumab for the potential treatment of SCD. For example, Novartis is developing crizanlizumab, which is a potential competitor of inclacumab. Both crizanlizumab and inclacumab are human monoclonal antibodies against P-selectin for the treatment of VOC in patients with SCD. Novartis has announced that it anticipates filing a biologics license application for crizanlizumab in 2019, which would result in a direct competitor entering the market significantly earlier than inclacumab. We have competitors both in the United States and internationally, including major multinational pharmaceutical companies, specialty pharmaceutical companies, and biotechnology companies. Many of our competitors have substantially greater financial, technical, and other resources, such as larger research and development, marketing and manufacturing organizations. Additional mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. As a result, these companies may obtain regulatory approval more rapidly than we are able to and may be more effective in selling and marketing their products as well. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors may succeed in developing, acquiring or licensing on an exclusive basis, products that are more effective or less costly than any product candidate that we may develop, or achieve earlier patent protection, regulatory approval, product commercialization and market penetration than we do. Additionally, technologies developed by our competitors may render our potential product candidates uneconomical or obsolete, and we may not be successful in marketing our product candidates against competitors.

If the market opportunities for our product candidates are smaller than we believe they are, our revenue may be adversely affected, and our business may suffer. Our ability to successfully identify patients and acquire a significant market share will be necessary for us to achieve profitability and growth.

Our initial research and product development efforts are focused on the potential of voxelotor to treat SCD. Our projections of both the number of people who have SCD, as well as the subset of people with SCD who have the potential to benefit from treatment with voxelotor, are based on our beliefs and estimates. These estimates have been derived from a variety of sources, including the scientific literature, and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of SCD. The number of patients may turn out to be lower than expected. The effort to identify patients with diseases we seek to treat is in early stages, and we cannot accurately predict the number of patients for whom treatment might be possible. Additionally, the potentially addressable patient population for our product candidates may be limited or may not be amenable to treatment with our product candidates, and new patients may become increasingly difficult to identify or gain access to, which would adversely affect our results of operations and our business. Restrictions on labeling of any approved product, including any restrictions that may be imposed in connection with any approval under Subpart H, may also limit the size of the potential market for our product candidates. Further, even if we obtain significant market share for our product candidates, because the potential target populations are small, we may never achieve profitability despite obtaining such significant market share.

Risks Related to Our Business and Industry

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

We are highly dependent on the management, research and development, clinical, financial and business development expertise of our executive officers, as well as the other members of our scientific and clinical teams. Although we have employment offer letters with each of our executive officers, each of them may terminate their employment with us at any time. We do not maintain “key person” insurance for any of our executives or employees.

Recruiting and retaining qualified scientific, medical and clinical and technical operations personnel and, if we progress the development of our drug pipeline toward scaling up for commercialization, sales and marketing personnel, will also be critical to our success. The loss of the services of our executive officers or other key employees could impede the achievement of our research, development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Furthermore, replacing executive officers and key employees may be difficult and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to successfully develop, gain regulatory approval for and commercialize our product candidates. Competition to hire qualified personnel in our industry and geographic market is intense, and we may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. Furthermore, to the extent we hire personnel from competitors, we may be subject to allegations that they have been improperly solicited or that they have divulged proprietary or other confidential information, or that their former employers own their research output. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to pursue our growth strategy will be limited.

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

As our development progresses, we expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of research, drug development, regulatory affairs and, if any of our product candidates are filed for or receives marketing approval, sales, marketing and distribution. 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 our limited financial resources, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

If we are not successful in discovering, developing, acquiring or commercializing additional product candidates, our ability to expand our business and achieve our strategic objectives would be impaired.

Although a substantial amount of our effort will focus on the continued clinical testing, potential approval and commercialization of voxelotor, a key element of our strategy is to pursue, develop and commercialize a portfolio of products utilizing proprietary discovery and development technology. We are seeking to do so through our internal research programs and may also selectively pursue commercially synergistic in-licensing or acquisition of additional assets, such as inclacumab. With the exception of voxelotor, all of our other potential product candidates remain in earlier development stages. Research programs to identify product candidates require substantial technical, financial and human resources, whether or not any product candidates are ultimately identified. Our research programs may initially show promise in identifying potential product candidates, yet fail to yield product candidates for clinical development for many reasons, including the following:

- the research methodology used may not be successful in identifying potential product candidates;
- competitors may develop alternatives that render our product candidates obsolete or less attractive;
- product candidates we develop may nevertheless be covered by third parties' patents or other exclusive rights;
- the market for a product candidate may change during our program so that such a product may become unreasonable to continue to develop;
- a product candidate may on further study be shown to have harmful side effects, lack of potential efficacy or other characteristics that indicate it is unlikely to meet applicable regulatory criteria or remain reasonable to continue to develop;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all; and
- a product candidate may not be accepted as safe and effective by patients, the medical community or third-party payors, if applicable.

If we fail to develop and successfully commercialize inclacumab or any other product candidates, our business and future prospects may be harmed and our business will be more vulnerable to any problems that we encounter in developing and commercializing voxelotor.

If successful product liability claims are brought against us, we may incur substantial liability and costs. If the use of our product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to our product candidates, our regulatory approvals could be revoked or otherwise negatively impacted and we could be subject to costly and damaging product liability claims.

The use of our product candidates, including voxelotor or inclacumab, in clinical trials and the sale of any products for which we obtain marketing approval exposes us to the risk of product liability claims. Product liability claims might be brought against us by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. There is a risk that our product candidates may induce adverse events. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- impairment of our business reputation;
- withdrawal of clinical trial participants;
- costs due to related litigation;
- distraction of management's attention from our primary business;
- substantial monetary awards to patients or other claimants;
- increased warnings on product labels or additional restrictions imposed by regulatory authorities;
- the recall of our product candidates;
- the inability to commercialize our product candidates; and
- decreased demand for our product candidates, if approved for commercial sale.

We carry product liability insurance in amounts that we believe are sufficient in light of our current clinical programs, but we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. If and when we obtain marketing approval for product candidates, we intend to expand our insurance coverage to include the

sale of commercial products, but we may be unable to obtain product liability insurance on commercially reasonable terms or in adequate amounts. On occasion, large judgments have been awarded in class action lawsuits based on drugs or medical treatments that had unanticipated adverse effects. A successful product liability claim or series of claims brought against us could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business.

During the course of treatment, patients may suffer adverse events, including death, for reasons that may or may not be related to our product candidates. Such events can be time-consuming to address, could subject us to costly litigation, require us to pay substantial amounts of money to injured patients, can delay, negatively impact or end our opportunity to receive or maintain regulatory approval to market our product candidates, if approved, can require us to suspend or abandon our commercialization efforts of any approved product candidates, or can impair our ability to raise funds to pursue our development or commercialization efforts. Investigations of these events may interrupt our sales efforts, delay our regulatory approval process in other countries, or impact and limit the type of regulatory approvals our product candidates receive or maintain. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on our business, financial condition or results of operations.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could harm our business.

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

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

In addition, we may incur substantial costs in order 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. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

We may choose to use our financial and human resources to pursue a particular research program or product candidate and fail to capitalize on other programs or product candidates that may ultimately be more profitable or for which there is a greater likelihood of success.

Because we have limited resources, we may forego or delay the pursuit of opportunities with programs or product candidates or for indications that later prove to have greater commercial potential than those we do pursue. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs for product candidates, including voxelotor or inclacumab, may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through strategic collaboration, licensing or other partnering arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate, or we may allocate internal resources to a product candidate in a therapeutic area in which it would have been more advantageous to enter into a partnering arrangement.

Any collaboration arrangements that we might enter into in the future may not be successful, which could adversely affect our operations and financial condition.

We may seek collaboration arrangements with pharmaceutical or biotechnology companies for the development or commercialization of voxelotor, inclacumab and potential future product candidates. We may enter into these arrangements on a selective basis depending on the merits of retaining commercialization rights for ourselves as compared to entering into selective collaboration arrangements with leading pharmaceutical or biotechnology companies for our product candidates, both in the United States and internationally. To the extent that we decide to enter into collaboration agreements, we will face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for any collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the

likelihood of approval by the FDA or comparable foreign regulatory authorities, the potential market for a product candidate, the costs and complexities of manufacturing and delivering a product candidate to patients, the potential of competing products, any uncertainty with respect to our ownership of technology, which can occur if there is a challenge to our ownership without regard to the merits of the challenge and industry and market conditions generally. Moreover, collaboration arrangements are complex and time consuming to negotiate, document and implement, and we have not previously established our ability to undertake these activities successfully. We may not be successful in our efforts to establish and implement collaborations or other alternative arrangements should we so chose to enter into such arrangements. The terms of any collaborations or other arrangements that we may establish may not be favorable to us.

Any future collaborations that we enter into may not be successful. The success of our collaboration arrangements will depend heavily on the efforts and activities of us and our collaborators. Collaborators generally have significant discretion in determining the efforts and resources that they will apply to these collaborations. Disagreements between parties to a collaboration arrangement regarding clinical development and commercialization matters can lead to delays in the development process or commercializing the applicable product candidate and, in some cases, costly and time-consuming disputes or termination of the collaboration arrangement. These disagreements can be difficult to resolve successfully, and any such termination or expiration would adversely affect us financially and could harm our business reputation. Many collaborations in the pharmaceutical and biotechnology industries do not result in successful outcomes, for a wide variety of reasons.

Our anticipated international operations may expose us to business, regulatory, political, operational, financial, pricing and reimbursement and economic risks associated with doing business outside of the United States.

Our business strategy currently incorporates potential international expansion as we conduct our multi-national Phase 3 HOPE Study of voxelotor for the potential treatment of SCD inside and outside the United States, and plan to seek to obtain regulatory approval to and commercialize voxelotor in patient populations inside and outside the United States. If voxelotor is approved, we may hire sales representatives and conduct physician and patient association outreach activities outside of the United States. Doing business internationally involves a number of risks, including but not limited to:

- multiple, conflicting, and changing laws and regulations such as privacy regulations, tax laws, export and import restrictions, employment laws, regulatory requirements, and any requirements to obtain other governmental approvals, permits, and licenses;
- failure by us to obtain and maintain regulatory approvals for the sale or use of our products in various countries;
- additional potentially relevant third-party patent rights;
- complexities and difficulties in obtaining protection for and enforcing our intellectual property;
- difficulties in staffing and managing foreign operations;
- complexities associated with managing multiple payor reimbursement regimes, government payors, or patient self-pay systems;
- limits in our ability to penetrate international markets;
- financial risks, such as longer payment cycles, difficulty collecting accounts receivable, the impact of local and regional financial crises on demand and payment for our products, and exposure to foreign currency exchange rate fluctuations;
- natural disasters, political and economic instability, including wars, terrorism, and political unrest, outbreak of disease, boycotts, curtailment of trade, and other business restrictions;
- certain expenses including, among others, expenses for travel, translation, and insurance; and
- regulatory and compliance risks that relate to maintaining accurate information and control over sales and activities that may fall within the purview of the U.S. Foreign Corrupt Practices Act, its books and records provisions, or its anti-bribery provisions.

Any of these factors could significantly harm our future international expansion and operations and, consequently, our results of operations.

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations (collectively, “Trade Laws”). We can face serious consequences for violations.

Among other matters, Trade Laws prohibit companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of Trade Laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We also expect our non-U.S. activities to increase in time. We engage third parties for clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities.

Unfavorable global economic conditions could adversely affect our business, financial condition or results of operations.

Our ability to invest in and expand our business and meet our financial obligations, to attract and retain third-party contractors and collaboration partners and to raise additional capital depends on our operating and financial performance, which, in turn, is subject to numerous factors, including the prevailing economic and political conditions and financial, business and other factors beyond our control, such as the rate of unemployment, the number of uninsured persons in the United States, the results of presidential elections, other political influences and inflationary pressures. For example, an overall decrease in or loss of insurance coverage among individuals in the United States as a result of unemployment, underemployment or the potential repeal of certain provisions of the ACA, may decrease the demand for healthcare services and pharmaceuticals. If fewer patients are seeking medical care because they do not have insurance coverage, we may experience difficulties in any eventual commercialization of our product candidates and our business, results of operations, financial condition and cash flows could be adversely affected.

In addition, certain events have caused, and may cause or contribute to global financial crises, which have triggered and may in the future lead to extreme volatility and disruptions in the capital and credit markets. For example, in June 2016, the United Kingdom (the “U.K.”), held a referendum in which voters supported the exit of the U. K. from the EU (commonly referred to as “Brexit”), which could cause disruptions to and create uncertainty surrounding our business, including affecting our existing relationships with third parties that conduct some of our nonclinical studies and clinical trials and our ability to enter into new relationships with vendors and other third-party contractors, which could have an adverse effect on our business, financial results and operations. The referendum is non-binding, but if passed into law, negotiations would commence to determine the future terms of the U.K.’s relationship with the EU, including the terms of trade between the U.K. and the EU. Brexit has already and could continue to adversely affect European and/or worldwide economic and market conditions and could continue to contribute to instability in the global financial markets. The measures could also adversely affect our ability to raise additional capital, potentially disrupt the markets in which we currently conduct and plan to conduct operations and the tax jurisdictions in which we operate and adversely change tax benefits or liabilities in these or other jurisdictions. In addition, changes in, and legal uncertainty with regard to, national and international laws and regulations may present difficulties for our clinical and regulatory strategy.

A severe or prolonged economic downturn could result in a variety of risks to our business, including reduced ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy could also strain our relationships with our contractors and potential collaboration partners. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business.

Misconduct or other improper activities of our employees, agents, contractors or collaborators could adversely affect our reputation and our business, prospects, operating results and financial conditions.

We cannot ensure that our compliance controls, policies, and procedures will in every instance protect us from acts committed by our employees, agents, contractors or collaborators that would violate the law or regulations of the jurisdictions in which we operate, including FDA, healthcare, employment, foreign corrupt practices, environmental, competition, and patient privacy regulations. Misconduct by our employees, agents, contractors, or collaborators could include intentional or unintentional failures to:

- comply with EMA or FDA regulations or similar regulations of comparable foreign regulatory authorities;
- provide accurate information to the FDA or EMA or comparable foreign regulatory authorities;
- comply with cGMP regulations and manufacturing standards that we have established and comply with applicable healthcare fraud and abuse regulations in the jurisdictions in which we operate;
- report financial information or data accurately; or
- disclose unauthorized activities to us.

In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Misconduct could also involve the improper use of, including trading on, information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation.

Additionally, our business activities may be subject to the Foreign Corrupt Practices Act, or FCPA, and similar anti-bribery or anti-corruption laws, regulations or rules of other countries in which we operate. The FCPA generally prohibits offering, promising, giving, or authorizing others to give anything of value, either directly or indirectly, to a non-U.S. government official in order to influence official action, or otherwise obtain or retain business. The FCPA also requires public companies to make and keep books and records that accurately and fairly reflect the transactions of the corporation and to devise and maintain an adequate system of internal accounting controls. Our business is heavily regulated and therefore involves significant interaction with public officials, including officials of non-U.S. governments. Additionally, in many other countries, the health care providers who prescribe pharmaceuticals are employed by their government, and the purchasers of pharmaceuticals are government entities; therefore, our dealings with these prescribers and purchasers are subject to regulation under the FCPA.

There is no certainty that all of our employees, agents, contractors, or collaborators, or those of our affiliates, will comply with all applicable laws and regulations, particularly given the high level of complexity of these requirements. We have adopted a code of conduct, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may be ineffective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these requirements. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business.

We or the third parties upon whom we depend may be adversely affected by earthquakes or other natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Earthquakes or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as the manufacturing facilities of our third-party contract manufacturers, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business.

Our internal computer systems, or those of our third party vendors, may fail or suffer security breaches, which could result in a material disruption of our drug development programs.

Despite the implementation of security measures, our internal computer systems and those of our third party vendors 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 result in a material disruption of our drug development programs. For example, the loss of data from completed or ongoing clinical trials or nonclinical studies 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. To the extent that any disruption or security breach were to result in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development of our product candidates could be delayed.

Risks Related to Our Equity Securities

We incur significant costs, and expend significant time and effort, to comply with the rules applicable to us as a public company, including Section 404 of the Sarbanes Oxley Act of 2002. If we fail to comply with these rules, including maintaining proper and effective systems of disclosure controls and internal controls over financial reporting, the accuracy and timeliness of our financial reporting may be adversely affected, and we could be subject to sanctions or other penalties that would harm our business.

As a public company, we are subject to the reporting requirements of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), Section 404, or Section 404, of the Sarbanes-Oxley Act of 2002, or Sarbanes Oxley, and the rules and regulations of The NASDAQ Global Select Stock Market, or NASDAQ. The Exchange Act requires us to file accurate and timely quarterly, annual and current reports with the SEC. Section 404 generally requires our management and independent registered public accounting firm to report on the effectiveness of our internal control over financial reporting and requires us to include an opinion from our independent registered public accounting firm on the effectiveness of our internal control over financial reporting. We are also subject to significant corporate governance and executive compensation-related provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act, or Dodd-Frank, including the “say on pay” rules adopted by the SEC under Dodd-Frank. We incur significant legal, accounting and other expenses, and expend significant time and effort by management and other personnel, to comply with the rules applicable to us as a public company.

We carried out an evaluation, under the supervision and with the participation of our management, including our Chief Executive Officer and our Chief Financial Officer, of the effectiveness of our internal control over financial reporting for the purpose of providing the reports required by Section 404. Based on our assessment and using the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") criteria, our management, Chief Executive Officer and Chief Financial Officer, have concluded that, as of September 30, 2018, our internal control over financial reporting was effective. As required under Section 404 of Sarbanes-Oxley, our independent registered public accounting firm tested the design and operating effectiveness of our controls over financial reporting and provided an annual attestation report with respect to our internal control over financial reporting as of December 31, 2017. During the course of our or their subsequent review and testing, however, material weaknesses or significant deficiencies may be identified and we may be unable to remediate them before we must provide the required reports. If material weaknesses or significant deficiencies in our internal control over financial reporting are identified in the future, we may not detect or remediate errors on a timely basis and our consolidated financial statements may be materially misstated. We or our independent registered public accounting firm may not be able to conclude on an ongoing basis that we have effective internal control over financial reporting, which could harm our operating results, cause investors to lose confidence in our reported financial information and cause the trading price of our stock to fall. In addition, any failure to report our financial results on an accurate and timely basis could result in sanctions, lawsuits, delisting of our shares from NASDAQ or other adverse consequences that would materially harm our business.

Moreover, stockholder activism, the current political environment, and increased levels of government scrutiny and regulatory reform may lead to substantial new regulations and disclosure obligations for public companies, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate. Our management and other personnel will need to devote a substantial amount of time to any new compliance initiatives. In addition, any new rules and regulations will increase our legal and financial compliance costs and will make some activities more time consuming and costly. For example, we expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to incur substantial costs to maintain our current levels of such coverage. New laws and regulations as well as changes to existing laws and regulations affecting public companies, including the provisions of Sarbanes-Oxley and rules adopted by the SEC and by NASDAQ, would likely result in increased costs to us as we respond to their requirements.

The market price of our common stock has been and may continue to be highly volatile.

The market price of our common stock has experienced volatility since our initial public offering in August 2015 and is likely to continue to be volatile. Our stock price could be subject to wide fluctuations in response to a variety of factors, including the following:

- adverse results or delays in, or the halting of, our nonclinical studies or clinical trials, including in our only clinical program, which is for voxelotor for the treatment of SCD;
- reports of adverse events in our clinical program for voxelotor for SCD, or other indications that we may pursue, or clinical trials of any other product candidates that we may develop;
- any delay in filing an NDA for voxelotor or an investigational new drug application, or IND, or NDA for inclacumab or any other product candidates that we may develop and any adverse development or perceived adverse development with respect to the FDA's review of that IND or NDA;
- failure to develop successfully and commercialize voxelotor, inclacumab or any other product candidates that we may develop;
- adverse regulatory decisions affecting voxelotor, inclacumab or any other product candidates we may develop, including any delay in or denial of potential approval in accordance with our plans and expectations;
- inability to obtain additional funding;
- failure to prosecute, maintain or enforce our intellectual property rights;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- changes in laws or regulations applicable to future products;
- inability to obtain adequate product supply for our product candidates or the inability to do so at acceptable prices;
- introduction of new products, services or technologies by our competitors;
- failure to enter into or perform under strategic collaborations;

- failure to meet or exceed any financial projections that we or the investment community may provide;
- the perception of the pharmaceutical industry by the public, legislatures, regulators and the investment community;
- announcements of significant acquisitions, strategic partnerships, joint ventures or capital commitments by us or our competitors;
- additions or departures of key scientific or management personnel;
- significant lawsuits, including patent or stockholder litigation;
- changes in the market valuations of similar companies;
- sales of our common stock by us or our stockholders in the future;
- trading volume of our common stock; and
- the other risks described in this “Risk Factors” section.

In addition, companies trading in the stock market in general, and NASDAQ in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance. For example, negative publicity regarding drug pricing and price increases by pharmaceutical companies has negatively impacted, and may continue to negatively impact, the markets for biotechnology and pharmaceutical stocks. In the past, following periods of volatility in the market, securities class-action litigation has often been instituted against companies. Such litigation, if instituted against us, could result in substantial costs and diversion of management’s attention and resources, which could materially and adversely affect our business, financial condition, results of operations and growth prospects.

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or our guidance.

Our quarterly and annual operating results may fluctuate significantly in the future, which makes it difficult for us to predict our future operating results. Our operating results may fluctuate due to a variety of factors, many of which are outside of our control and may be difficult to predict, including the following:

- the timing and cost of, and level of investment in, research and development activities relating to our product candidates, which may change from time to time;
- the timing and success or failure of clinical trials for our product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners;
- our ability to obtain regulatory approval for our product candidates, and the timing and scope of any such approvals we may receive;
- our ability to commercialize any of our product candidates, if approved, and the timing and costs of our commercialization activities;
- the cost of manufacturing our product candidates, which may vary depending on the quantity of production and the terms of our agreements with manufacturers;
- our ability to attract, hire and retain qualified personnel;
- expenditures that we will or may incur to acquire or develop additional product candidates and technologies;
- the level of demand for our product candidates, should they receive approval, which may vary significantly;
- future accounting pronouncements or changes in our accounting policies;
- the risk/benefit profile, cost and reimbursement policies with respect to our products candidates, if approved, and existing and potential future drugs that compete with our product candidates;
- whether any of our product candidates are subject to any compliance-related challenges or sanctions, or any intellectual-property related challenges; and
- the changing and volatile U.S., European and global economic environments.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated financial guidance we may provide.

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

We will need additional capital in the future to continue our planned operations. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. We may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time. If we sell common stock, convertible securities or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. These sales may also result in material dilution to our existing stockholders, and new investors could gain rights superior to our existing stockholders.

We are also authorized to grant stock options and other equity-based awards to our employees, directors and consultants pursuant to our 2015 Stock Option and Incentive Plan (the “2015 Plan”). The number of shares available for future grant under the 2015 Plan will automatically increase each year by up to 4% of all shares of our capital stock outstanding as of December 31 of the prior calendar year, subject to the ability of our board of directors or compensation committee to take action to reduce the size of the increase in any given year. In addition, in January 2017 our board of directors approved our 2017 Inducement Equity Plan, or 2017 Inducement Plan. The 2017 Inducement Plan enables us and our subsidiaries to grant non-qualified stock options and other equity-based awards to induce employees who are not currently employed by us or our subsidiaries to accept employment with us or our subsidiaries. The number of shares reserved for grant under the 2017 Inducement Plan is 1,050,000 shares, subject to adjustment for reorganization, recapitalization, stock dividend, stock split, or similar changes in our capital stock. In addition, we have reserved shares of common stock for issuance pursuant to our 2015 Employee Stock Purchase Plan, or 2015 ESPP, which number of shares will automatically increase each year on January 1, from January 1, 2016 to January 1, 2025, by the lesser of (i) 3,000,000 shares of common stock, (ii) 1% of all shares of our capital stock outstanding as of December 31 of the prior calendar year, or (iii) such lesser number of shares as determined by the administrator of our 2015 ESPP. Currently, we plan to register the increased number of shares available for issuance under the 2015 Plan and the 2015 ESPP each year. If our board of directors elects to increase the number of shares available for future grant under the 2015 Plan, the 2017 Inducement Plan or the 2015 ESPP, our stockholders may experience additional dilution, and our stock price may fall.

A significant portion of our total outstanding shares may be sold into the market in the near future, which could cause the market price of our common stock to drop significantly.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. A significant portion of our outstanding shares of common stock are held by a small number of stockholders, including our directors, officers and significant stockholders. Sales by our stockholders of a substantial number of shares, or the expectation that such sales may occur, could significantly reduce the market price of our common stock.

We have also registered all shares of our common stock subject to options or other equity awards issued or reserved for future issuance under our equity incentive plans. As a result, these shares will be available for sale in the public market subject to vesting arrangements and exercise of options, and restrictions under applicable securities laws. In addition, our directors, executive officers and certain affiliates have established or may in the future establish programmed selling plans under Rule 10b5-1 of the Exchange Act for the purpose of effecting sales of our common stock. If any of these events cause a large number of our shares to be sold in the public market, the sales could reduce the trading price of our common stock and impede our ability to raise future capital.

Additionally, certain holders of our common stock, or their transferees, have rights to require us to file one or more registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. If we were to register the resale of these shares, they could be freely sold in the public market. If these additional shares are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

Our principal stockholders and management own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

Our executive officers, directors, five percent stockholders and their affiliates beneficially owned approximately 42.1% of our outstanding common stock as of November 1, 2018, based on the latest publicly available information.

These stockholders have the ability to influence us through their ownership positions. These stockholders may be able to determine all matters requiring stockholder approval. For example, these stockholders, acting together, may be able to control elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may believe are in your best interest as one of our stockholders.

We have broad discretion in the use of our capital resources consisting of cash and cash equivalents and short and long-term marketable securities, and may invest or spend our capital resources in ways with which you do not agree or in ways that ultimately may not increase the value of your investment.

We have broad discretion over the use of our capital resources consisting of cash and cash equivalents and short and long-term marketable securities. You may not agree with our decisions, and our use of our capital resources may not yield any returns to our stockholders. We expect to use our existing capital resources to continue the clinical development of voxelotor for the treatment of SCD, including our ongoing Phase 3 HOPE Study and Phase 2a HOPE-KIDS 1 Study and planned clinical pharmacology studies, our other research and development activities including other clinical and nonclinical studies, including for inclacumab, and for working capital and general corporate purposes. Our failure to apply our capital resources effectively could compromise our ability to pursue our growth strategy and we might not be able to yield a significant return, if any, on our investment of these resources. Our stockholders will not have the opportunity to influence our decisions on how to use our capital resources.

Provisions in our restated certificate of incorporation and amended and restated bylaws, as well as provisions of Delaware law, could make it more difficult for a third party to acquire us or increase the cost of acquiring us, even if doing so would benefit our stockholders or remove our current management.

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

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

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

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

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

Our future ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

We have incurred substantial losses during our history and do not expect to become profitable in the near future and we may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards, or NOLs, and other pre-change tax attributes (such as research tax credits) to offset its post-change income or taxes may be limited. We experienced an ownership change as a result of our IPO and an ownership change as a result of our follow-on offerings, however we do not believe that these ownership changes will significantly limit our ability to use these pre-change NOL carryforwards. We may experience subsequent shifts in our stock ownership, including as a result of our future follow-on offering, some of which are outside of our control. As a result, if we earn net taxable income, our ability to use our pre-change NOL carryforwards to offset U.S. federal taxable income may become subject to limitations, which could potentially result in increased future tax liability to us. In addition, at the state level, there may be periods during which the use of NOLs is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed. In addition, pursuant to the Tax Cuts and Jobs Act of 2017 we may not use net operating loss carry-forwards arising in taxable years beginning after December 31, 2017 to reduce our taxable income in any year by more than 80% and we may not carry back any net operating losses arising in taxable years ending after December 31, 2017 to prior years. These new rules apply regardless of the occurrence of an "ownership change."

We do not currently intend to pay dividends on our common stock, and, consequently, our stockholders' ability to achieve a return on their investment will depend on appreciation in the price of our common stock.

We do not currently intend to pay any cash dividends on our common stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Therefore, you are not likely to receive any dividends on your common stock for the foreseeable future. Since we do not intend to pay dividends, your ability to receive a return on your investment will depend on any future appreciation in the market value of our common stock. There is no guarantee that our common stock will appreciate or even maintain the price at which our holders have purchased it.

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

The trading market for our common stock depends, in part, on the research and reports that securities or industry analysts publish about us or our business. Securities and industry analysts may not publish an adequate amount of research on our company, which may negatively impact the trading price for our stock. In addition, if one or more of the analysts who cover us downgrade our stock or publish inaccurate or unfavorable research about our business, our stock price would likely decline or increase in volatility. Further, if our operating results fail to meet the forecasts of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

We may be subject to adverse legislative or regulatory tax changes that could negatively impact our financial condition.

The rules dealing with U.S. federal, state and local income taxation are constantly under review by persons involved in the legislative process and by the IRS and the U.S. Treasury Department. Changes to tax laws (which changes may have retroactive application) could adversely affect our stockholders or us. In recent years, many such changes have been made and changes are likely to continue to occur in the future. For example, in December 2017, Congress passed the Tax Cuts and Jobs Act, which made broad and complex changes to the tax laws. We cannot predict whether, when, in what form, or with what effective dates, tax laws, regulations and rulings may be enacted, promulgated or decided, which could result in an increase in our, or our stockholders', tax liability or require changes in the manner in which we operate in order to minimize increases in our tax liability.

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

a) *Sales of Unregistered Securities*

None.

b) *Use of Proceeds from our Initial Public Offering of Common Stock*

Not applicable.

c) *Repurchases of Shares or of Company Equity Securities*

None.

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

Item 6. Exhibits

See the Exhibit Index on the page prior to the signature page to this Quarterly Report on Form 10-Q for a list of the exhibits filed as part of this Quarterly Report, which Exhibit Index is incorporated herein by reference.

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Date	Number	Filed Herewith
3.1	Restated Certificate of Incorporation.	S-1/A	7/31/2015	3.2	
3.2	Amended and Restated Bylaws.	S-1/A	7/31/2015	3.4	
4.1	Specimen Common Stock Certificate	S-1/A	7/31/2015	4.1	
10.1#	License Agreement, by and between the Company and F. Hoffmann-La Roche Ltd. and Hoffmann-La Roche Inc., dated August 22, 2018				X
10.2	First Amendment to Lease, by and between the Company and HCP Oyster Point III LLC, dated August 29, 2018	8-K	8/30/2018	10.1	
31.1	Certification of Principal Executive Officer required by Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
31.2	Certification of Principal Financial Officer required by Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
32.1*	Certification of Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				X
101.INS	XBRL Instance Document				X
101.SCH	XBRL Taxonomy Extension Schema Document				X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document				X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.				X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.				X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.				X

Confidential treatment has been requested for certain information contained in this Exhibit (indicated by asterisks). Such information has been omitted and filed separately with the SEC.

* The certification attached as Exhibit 32.1 that accompanies this Quarterly Report on Form 10-Q is not deemed filed with the SEC and is not to be incorporated by reference into any filing of Global Blood Therapeutics, Inc. 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 this Form 10-Q, irrespective of any general incorporation language contained in such filing.

SIGNATURES

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

Global Blood Therapeutics, Inc.

Date: November 6, 2018

By: /s/ Ted W. Love, M.D.
Ted W. Love, M.D.
President and Chief Executive Officer
(Principal Executive Officer)

Date: November 6, 2018

By: /s/ Jeffrey Farrow
Jeffrey Farrow
Chief Financial Officer
(Principal Financial Officer)

Exhibit 10.1

Execution Version
Confidential

License Agreement

This Agreement is entered into with effect as of the Effective Date (as defined below)

by and between

F. Hoffmann-La Roche Ltd

with an office and place of business at Grenzacherstrasse 124, 4070 Basel, Switzerland ("Roche Basel")

and

Hoffmann-La Roche Inc.

with an office and place of business at 150 Clove Road, Suite 8, Little Falls, New Jersey 07424, U.S.A. ("Roche US"; Roche Basel and Roche US together referred to as "Roche")

on the one hand

and

Global Blood Therapeutics, Inc.

with an office and place of business at 171 Oyster Point Boulevard, Suite 300, South San Francisco, California 94080 (hereinafter referred to as "GBT")

on the other hand.

* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

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* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

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* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

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* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

License Agreement

WHEREAS, Roche has discovered and has conducted certain research and development related to, and possesses certain proprietary intellectual property with respect to, inclacumab, also known as [***]; and

WHEREAS, GBT has the resources and expertise in the development, manufacturing and commercialization of pharmaceutical products;

WHEREAS, Roche and GBT have entered into a Material Transfer Agreement and Right of Negotiation, effective as of March 23, 2018 ("**MTA**");

WHEREAS, Roche under the MTA has transferred to GBT technical and other proprietary material and accompanying data relating to and including samples of cells from the master cell bank expressing inclacumab as set forth in Appendix 1.51 under the title "Roche MTA Material" ("**Roche MTA Material**");

WHEREAS, GBT under the MTA has used Roche MTA Material; and

WHEREAS, GBT desires to obtain, and Roche is willing to grant to GBT, an exclusive, royalty-bearing license to develop, manufacture and commercialize Compound and Products in the Field in the Territory (terms as defined below), subject to the terms and conditions hereof.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto, intending to be legally bound, do hereby agree as follows:

1. Definitions

As used in this Agreement, the following terms, whether used in the singular or plural, shall have the following meanings:

1.1 Affiliate

The term "Affiliate" shall mean any individual, corporation, association or other business entity that directly or indirectly controls, is controlled by, or is under common control with the Party in question. As used in this definition of "Affiliate," the term "control" shall mean the direct or indirect ownership of more than fifty percent (>50%) of the stock having the right to vote for directors thereof or the ability to otherwise control the management of the corporation or other business entity whether through the ownership of voting securities, by contract, resolution, regulation or otherwise. Anything to the contrary in this paragraph notwithstanding, neither [***], a [***] corporation [***] and/or its subsidiaries (if any) nor [***], a [***] corporation [***] and/or its subsidiaries (if any) shall be deemed as Affiliates of Roche unless Roche provides written notice to GBT of its desire to include [***], [***] and/or their respective subsidiaries (as applicable) as Affiliate(s) of Roche.

1.2 Agreement

The term "Agreement" shall mean this document including any and all appendices and amendments to it as may be added and/or amended from time to time in accordance with the provisions of this Agreement.

1.3 Agreement Term

The term “Agreement Term” shall mean the period of time commencing on the Effective Date and, unless this Agreement is terminated sooner as provided in Article 20, expiring on the date when no royalty or other payment obligations under this Agreement are due.

1.4 Applicable Law

The term “Applicable Law” shall mean any law, statute, ordinance, code, rule or regulation that has been enacted by a government authority (including without limitation, any Regulatory Authority) and is in force as of the Effective Date or comes into force during the Agreement Term, in each case to the extent that the same are applicable to the performance by the Parties of their respective obligations under this Agreement. For clarity, the term Applicable Law shall include GLP, GCP, and GMP and their foreign equivalents.

1.5 [***]
[***]

1.6 BLA

The term “BLA” shall mean a Biologics License Application, or similar application for marketing approval of a Product for use in the Field submitted to the FDA, or a foreign equivalent of the FDA.

1.7 Calendar Quarter

The term “Calendar Quarter” shall mean each period of three (3) consecutive calendar months, ending March 31, June 30, September 30, and December 31.

1.8 Calendar Year

The term “Calendar Year” shall mean the period of time beginning on January 1 and ending December 31, except for the first year which shall begin on the Effective Date and end on December 31.

1.9 Change of Control

The term “Change of Control” shall mean, with respect to a Party: (a) the acquisition by any Third Party of beneficial ownership of fifty percent (50%) or more of the then outstanding common shares or voting power of such Party, other than acquisitions by employee benefit plans sponsored or maintained by such Party; (b) the consummation of a business combination involving such Party, unless, following such business combination, the stockholders of such Party that owned directly or indirectly more than fifty percent (50%) of the then outstanding common shares or voting power of the entity immediately prior to such business combination beneficially own directly or indirectly more than fifty percent (50%) of the then outstanding common shares or voting power of the entity resulting from such business combination; or (c) the sale of all or substantially all of such Party’s assets or business relating to the subject matter of the Agreement.

1.10 Change of Control Group

The term “Change of Control Group” shall mean with respect to a Party, the person or entity, or group of persons or entities, that is the acquirer of, or a successor to, a Party in connection with a Change of Control, together with affiliates of such persons or entities that are not Affiliates of such Party immediately prior to the completion of such Change of Control of such Party.

1.11 Combination Product

The term “Combination Product” shall mean any pharmaceutical product that consists of a Compound and other active pharmaceutical ingredients or any combination of a Product sold together with another pharmaceutical product for a single invoiced price, whether packaged together or in the same therapeutic formulation.

1.12 Commercially Reasonable Efforts

The term “Commercially Reasonable Efforts” shall mean, [***].

1.13 Competing Product

The term “Competing Product” shall mean any product [***].

1.14 Compound

The term “Compound” shall mean Roche’s proprietary compound inclacumab, also known as [***], defined by its Complementary Determining Regions (“**CDRs**”) as specified in Appendix 1.14. Compound shall also include any modified compounds targeting P-selectin and derived from the Compound having one or more substitutions, additions and/or deletions in the amino acid sequences.

1.15 Confidential Information

The term “Confidential Information” shall mean any and all information, data or know-how (including Know-How), whether technical or non-technical, oral or written, that is disclosed by one Party or its Affiliates (“**Disclosing Party**”) to the other Party or its Affiliates (“**Receiving Party**”). Confidential Information shall not include any information, data or know-how that:

(i) was generally available to the public at the time of disclosure, or information that becomes available to the public after disclosure by the Disclosing Party other than through fault (whether by action or inaction) of the Receiving Party or its Affiliates,

(ii) can be evidenced by written records to have been already known to the Receiving Party or its Affiliates prior to its receipt from the Disclosing Party,

(iii) is obtained at any time lawfully from a Third Party under circumstances permitting its use or disclosure,

(iv) is developed independently by the Receiving Party or its Affiliates as evidenced by written records other than through knowledge of Confidential Information, or

(v) is approved in writing by the Disclosing Party for release by the Receiving Party.

The terms of this Agreement shall be considered Confidential Information of the Parties.

All information disclosed by a Party under the NDA or MTA is deemed the Confidential Information of such Party under this Agreement.

1.16 Continuation Election Notice

The term “Continuation Election Notice” shall mean the notice Roche provides to GBT under Section 20.3.2.

1.17 Control

The term “Control” shall mean (as an adjective or as a verb including conjugations and variations such as “Controls” “Controlled” or “Controlling”) (a) with respect to Patent Rights and/or Know-How, the possession by a Party of the ability to grant a license or sublicense of such Patent Rights and/or Know-How as provided herein without (i) violating the terms of any agreement or arrangement between such Party and any other party or (ii) requiring the payment of any additional consideration from such Party to any other party, and (b) with respect to proprietary materials, the possession by a Party of the ability to supply such proprietary materials to the other Party as provided herein without violating the terms of any agreement or arrangement between such Party and any other party.

1.18 Cover

The term “Cover” shall mean (as an adjective or as a verb including conjugations and variations such as “Covered,” “Coverage” or “Covering”) that the developing, making, using, offering for sale, promoting, selling, exporting or importing of a given compound, formulation or product would infringe a Valid Claim in the absence of a license under the Patent Rights to which such Valid Claim pertains. The determination of whether a compound, formulation, process or product is Covered by a particular Valid Claim shall be made on a country-by-country basis.

1.19 Data Room

The term “Data Room” shall mean the electronic due diligence data room established by GBT at an external provider (e.g. Intralinks or Box) containing all material data and information, including but not limited to GBT Patent Rights and material clinical data, regulatory correspondence, and Chemistry, Manufacturing, and Controls (“**CMC**”) data, that is (i) related to the Compound and/or Products and (ii) Controlled by GBT, received from Roche or generated by GBT or by a Third Party on behalf of GBT. GBT shall have no obligation to share any information related to compounds or products or other technologies not covered by this Agreement.

1.20 Effective Date

The term “Effective Date” shall mean August 22, 2018.

1.21 EMA

The term “EMA” shall mean the European Medicines Agency or any successor agency with responsibilities comparable to those of the European Medicines Agency.

1.22 EU

The term “EU” shall mean the organization of member states known as the European Union, as its membership may be altered from time to time, and any successor thereto, and all of its then current member countries. Notwithstanding the foregoing, the term EU shall in any event include the United Kingdom.

1.23 Expert

The term “Expert” shall mean an impartial and independent Third Party expert in the field of biopharmaceuticals who has not been employed or directly or indirectly compensated by either Party or its Affiliate in the [***] period preceding the relevant time (other than for its participation in the Expert Committee established under Section 10.6).

1.24 FDA

The term “FDA” shall mean the Food and Drug Administration of the United States of America or any successor agency thereto.

1.25 FDCA

The term “FDCA” shall mean the Food, Drug and Cosmetics Act, as amended, and the rules and regulations promulgated thereunder.

1.26 Field

The term “Field” shall mean all indications and uses excluding diagnostic indication and use.

1.27 First Commercial Sale

The term “First Commercial Sale” shall mean, with respect to a Product in any country, the first invoiced sale of such Product to a Third Party by GBT (or, if applicable, its Affiliates or Sublicensees) in such country following the receipt of any Regulatory Approval required for the sale of such Product, or if no such Regulatory Approval is required, the date of the first invoiced sale of a Product to a Third Party by GBT (or, if applicable, its Affiliates or Sublicensees) in such country.

1.28 GAAP

The term “GAAP” shall mean U.S. Generally Accepted Accounting Principles.

1.29 GBT Know-How

The term “GBT Know-How” shall mean the Know-How (other than Joint Know-How) that GBT Controls at the Effective Date and during the Agreement Term.

1.30 GBT Patent Rights

The term “GBT Patent Rights” shall mean the Patent Rights (other than the Joint Patent Rights) that GBT Controls, relating to or Covering a Product, at the Effective Date and during the Agreement Term.

1.31 [***]
[***]

1.32 Handle

The term “Handle” shall mean with respect to Patent Rights preparing, filing, prosecuting (including interference and opposition proceedings) and maintaining (including payment of maintenance fees and annuities and overseeing interferences, proceedings, reissue applications and proceedings, re-examination applications and proceedings, post-grant reviews, inter partes reviews, derivation proceedings and opposition proceedings).

1.33 Housemark

The term “Housemark” shall mean the names of Roche or its Affiliates, or variations of the names, and all related logotypes and symbols used by Roche or its Affiliates in connection with its products and/or services.

1.34 IFRS

The term “IFRS” shall mean International Financial Reporting Standards.

1.35 IND

The term “IND” shall mean an Investigational New Drug application as defined in the FDCA and applicable regulations promulgated by the FDA, or the equivalent application to the equivalent agency in any other country or group of countries, the filing of which is necessary to commence clinical testing of a Product in humans.

1.36 Insolvency Event

The term “Insolvency Event” shall mean circumstances under which a Party (i) has a receiver or similar officer appointed by a court of competent jurisdiction or governmental authority over all or a material part of its assets or undertaking; (ii) passes a resolution for winding-up (other than a winding-up for the purpose of, or in connection with, any solvent amalgamation or reconstruction) or a court makes an order to that effect or a court makes an order for administration (or any equivalent order in any jurisdiction); (iii) enters into any composition or arrangement with its creditors (other than relating to a solvent restructuring); (iv) ceases to carry on business; or (v) is unable to pay its debts as they become due in the ordinary course of business.

1.37 Invention

The term “Invention” shall mean any invention or improvement that is conceived or reduced to practice in connection with any activity carried out pursuant to this Agreement. Under this definition, an Invention may be made by employees or contractors of GBT solely or jointly with a Third Party (a “**GBT Invention**”), by employees or contractors of Roche solely or jointly with a Third Party (a “**Roche Invention**”), or jointly by respective employees or contractors of GBT and Roche with or without a Third Party (a “**Joint Invention**”).

1.38 Joint Know-How

The term “Joint Know-How” shall mean Know-How that is made jointly by the Parties or their respective Affiliates or Sublicensees in connection with any activity carried out pursuant to this Agreement.

1.39 Joint Patent Rights

The term “Joint Patent Rights” shall mean all Patent Rights Covering a Joint Invention.

1.40 Know-How

The term “Know-How” shall mean data, knowledge and information, including materials, samples, chemical manufacturing data, toxicological data, pharmacological data, preclinical data, proprietary assays related to the Compound, platforms, formulations, specifications, and quality control testing data, in each case that are necessary for the research, manufacture, development or commercialization of Compound or Products.

1.41 Lead Indication

The term “Lead Indication” shall mean Sickle Cell Disease (SCD).

1.42 [***]
[***]

1.43 Net Proceeds

The term “Net Proceeds” shall mean:

1.43.1 In the case of a Strategic Transaction that is a Partner Agreement, the aggregate proceeds as and when received by GBT or its Affiliates in consideration for the transfer of rights to the Compound and Product to the Partner under such Partner Agreement, including any upfront payments, event based milestone payments, royalty payments (subject to the proviso below) and all other monetary and non-monetary consideration (with non-monetary consideration being valued at the fair market value thereof), directly or indirectly from the Partner under such Partner Agreement, minus the transaction costs; *provided however* that excluded from any such proceeds are all of the following: [***] To the extent any Partner Agreement involves the license or other transfer of rights to compounds or products in addition to the license or transfer of rights to the Compound or Product, “Net Proceeds” with respect to such Partner Agreement shall be the portion of the payments listed above that is attributable to the value of the Compound or Product and not such other compounds or products.

1.43.2 In the case of a Change of Control of GBT that is a Strategic Transaction, the total consideration as and when received by GBT, minus the transaction costs, as consideration for the Change of Control (prior to the calculation of the Strategic Transaction Revenues), to the extent attributable to the value of the Compounds and Products and not any other assets of GBT, and shall include without limitation: [***]

1.44 Net Sales

The term “Net Sales” shall mean, for a Product in a particular period, the sum of (i) and (ii):

(i) the amount stated in GBT’s “sales” line of its audited financial statements with respect to such Product for such period (excluding sales to any Sublicensees that are not Affiliates of GBT). This amount reflects the gross invoice price at which such Product was sold or otherwise disposed of by GBT and its Affiliates to Third Parties (excluding sales to any Sublicensees that are not Affiliates of GBT, unless these Sublicensees are the final end-user) in such period reduced by gross-to-net deductions, if not previously deducted from such invoiced amount, taken in accordance with the then currently used IFRS or GAAP, as applicable.

By way of example, the gross-to-net deductions taken in accordance with GAAP as of the Effective Date include the following, without limitation:

(a) credits, reserves or allowances granted for (i) damaged, outdated, returned, rejected, withdrawn or recalled Product, (ii) wastage replacement and short-shipments (iii) billing errors, and (iv) indigent patient, patient assistance and/or reimbursement, access-to-care and similar programs (*e.g.*, price capitation);

(b) governmental price reductions and government mandated rebates;

(c) chargebacks, including those granted to wholesalers, buying groups and retailers;

(d) customer rebates, including cash sales incentives for prompt payment, cash and volume discounts;

(e) bad debt actually written off;

(f) freight, specialty distribution, specialty pharmacy expenses, insurance, import/export, and other transportation charges; and

(g) taxes and any other governmental charges or levies imposed upon or measured by the use, manufacture or sale of a Product (excluding income or franchise taxes).

(ii) for Sublicensees that are not Affiliates of GBT, the net sales amounts reported to GBT and its Affiliates in accordance with this Agreement and their then-currently used IFRS or GAAP, as applicable. For purposes of clarity, sales by GBT and its Affiliates to any Sublicensee shall be excluded from “Net Sales” unless the Sublicensee is the final end-user.

1.45 Other Indication

The term “Other Indication” shall mean any indication in the Field other than Lead Indication.

1.46 Partner

The term “Partner” shall mean a Third Party with which GBT will enter or has entered into a Partner Agreement.

1.47 Partner Agreement

The term “Partner Agreement” shall mean any agreement between GBT and a Third Party granting rights to develop and/or commercialize the Compound and/or one or more Products in the Field in the Territory or any portion thereof (including but not limited to a sub-license agreement with a Third Party of the rights granted hereunder to GBT or an assignment of this Agreement to a Third Party in whole or in part, subject to the other terms and conditions of this Agreement), but in all cases excluding: (a) any sub-contract pursuant to Section 2.6 and (b) any Change of Control transaction. The term Partner Agreement shall include all amendments to such Partner Agreement.

1.48 Party

The term “Party” shall mean GBT or Roche, as the case may be, and “Parties” shall mean GBT and Roche collectively.

1.49 Patent Rights

The term “Patent Rights” shall mean all rights under any patent or patent application, certificate of invention, application for certificate of invention or priority patent filing in any country of the Territory or under any international convention or treaty, including any patents issuing on such patent application, and further including any substitution, extension or supplementary protection certificate, reissue, reexamination, renewal, division, continuation or continuation-in-part of any of the foregoing.

1.50 Phase III Study

The term “Phase III Study” shall mean a human clinical trial that is prospectively designed to demonstrate statistically whether a product is safe and effective for use in humans in a manner sufficient to obtain Regulatory Approval to market such product in patients having the disease or condition being studied as described in 21 C.F.R. § 312.21(c) (FDCA), as amended from time to time**,** and the foreign equivalent thereof**.** For the avoidance of doubt, Phase III Study shall include any pivotal trials leading to submission of marketing authorization.

1.51 Product

The term “Product” shall mean any product, including without limitation any Combination Product, containing the Compound as pharmaceutically active agent, regardless of its finished form or formulation or dosage or presentation.

1.52 Regulatory Approval

The term “Regulatory Approval” shall mean any approvals, licenses, registrations or authorizations by a Regulatory Authority, necessary for the sale of a Product in the Field in a regulatory jurisdiction in the Territory.

1.53 Regulatory Authority

The term “Regulatory Authority” shall mean any national, supranational (e.g., the European Commission, the Council of the European Union, the European Medicines Agency), regional, state or local regulatory agency, department, bureau, commission, council or other governmental entity, including the FDA, in each country involved in the granting of Regulatory Approval for the Product.

1.54 Roche Know-How

The Roche Know-How as of the Effective Date is listed in Appendix 1.54 A) and Appendix 1.54 B) of this Agreement. Appendix 1.54 A) of this Agreement will be updated [***] after the Effective Date, as applicable.

1.55 Roche Patent Rights

The term “Roche Patent Rights” shall mean the Patent Rights relating to the Compound and any Product that Roche or its Affiliates Control as of the Effective Date. The Roche Patent Rights are listed in Appendix 1.55 (a). For purposes of clarity, the Patent Rights identified in Appendix 1.55 (b) (“**Excluded Patent Rights**”) are specifically excluded from the Roche Patent Rights.

1.56 Royalty Term

The term “Royalty Term” shall mean, with respect to a Product and for a given country, the period of time commencing on the date of First Commercial Sale of such Product in such country and ending on the later of the date that is (a) ten (10) years after the date of the First Commercial Sale of such Product in such country, or (b) the expiration of the last to expire Valid Claim within the Roche Patent Rights or Joint Patent Rights in such country Covering the use, manufacture, import, offering for sale, or sale of the Product.

1.57 Strategic Transaction

The term “Strategic Transaction” shall mean, with respect to GBT, (i) any Change of Control of GBT (for a period from the Effective Date until [***] after the First Commercial Sale of the first Product), or (ii) the execution of a Partner Agreement.

1.58 Sublicensee

The term “Sublicensee” shall mean a Third Party to which GBT has sublicensed rights granted to GBT under the Roche Patent Rights and Roche Know-How to develop and/or commercialize Products pursuant to this Agreement, but shall exclude any subcontractor described in Section 2.6.

1.59 Terminated Product

The term “Terminated Product” shall mean one or several Product(s) for which this Agreement has been terminated pursuant to Section 20.2, depending on whether the Agreement has been terminated in its entirety or on a Product-by-Product basis.

1.60 Territory

The term “Territory” shall mean all countries of the world.

1.61 Third Party

The term “Third Party” shall mean a person or entity other than (i) GBT or any of its Affiliates or (ii) Roche or any of its Affiliates.

1.62 US

The term “US” shall mean the United States of America and its territories and possessions.

1.63 US$

The terms “US Dollars” and “US$” shall mean US dollars.

1.64 Valid Claim

The term “Valid Claim” shall mean a claim contained in any (a) unexpired, in force and issued Patent Right that has not been disclaimed, revoked or held invalid by a final non-appealable decision of a court of competent jurisdiction or government agency or (b) pending patent application in any country of the Territory (i) that is on file with the applicable patent office and has shown evidence of reasonably consistent activity to advance to issuance of a patent and (ii) which application has been on file with the applicable patent office for no more than [***] years from the earliest date to which the patent application claims priority.

1.65 Additional Definitions

Each of the following definitions is set forth in the Section of this Agreement indicated below:

Definition	Section
Accounting Period	11.1
Acquired Party	20.3.7
Additional Assets	10.8.3
Additional Review Period	3.2
[***]	4.1
Arbitral Tribunal	22.3
Assignee	19
[***]	1.5
Bankruptcy Code	21
Breaching Party	20.2.1
[***]	1.1
CMC	1.19
Continuation Election Notice	20.3.2
[***]	3.1
Decision Period	14.10
Deduction Cap	10.7
Development Plan	6.2
Disclosing Party	1.15
Escalation Notice	22.2
Excluded Patent Rights	1.55
Exclusive Right of First Negotiation	3.2
Expert Committee	10.6
[***]	1.1
[***]	16.1
GBT Invention	1.37
GBT Notice	3.1
Governing Law	22.1
Indemnified Losses	16.1
Indemnifying Party	16.3
Initial Review Period	3.1
Initiating Party	14.10
Insolvency Party	20.2.2
Joint Invention	1.37
[***]	3.1
NDA	22.1
Negotiation Period	3.2
Non-Acquired Party	20.3.7
Non-Breaching Party	20.2.1
Non-Insolvency Party	20.2.2
Patent Term Extensions	14.13
Peremptory Notice Period	20.2.1
Publishing Notice	18.4
Receiving Party	1.15
Relative Commercial Value	10.5
[***]	3.3
[***]	3.2
Reverse Agreement	3.2

* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

Review Notice	3.1
[***]	16.2
[***]	3.1
Roche Invention	1.37
ROFN Exercise Notice	3.2
Settlement	14.10
SPCs	14.13
Strategic Transaction Revenues	10.8.1
Suit Notice	14.10
Term Sheet	3.2
Transfer	4.3
USAN	14.3
Valuation Firm	10.8.3

2. Grant of Licenses

2.1 Exclusive License

Roche hereby grants to GBT an exclusive (subject to Section 2.7 below, even as to Roche), sublicenseable (subject to Sections 2.4 and 2.5 and Article 3) worldwide right and license under Roche Patent Rights, Roche Know-How and Roche's interest in the Joint Know-How to research, have researched, develop, have developed, register, have registered, use, have used, make, have made, import, have imported, export, have exported, market, have marketed, distribute, have distributed, offer for sale, have offered for sale, sell and have sold Compound and Products in the Field in the Territory. This license shall include the right to sublicense in accordance with Sections 2.4 and 2.5 below.

2.2 Non-exclusive License

GBT hereby grants to Roche a non-exclusive, perpetual, worldwide, royalty-free license under GBT Patent Rights, Joint Patent Rights, GBT Know-How, Joint Know-How to research, have researched, develop, have developed, register, have registered, use, have used, make, have made, import, have imported, export, have exported, market, have marketed, distribute, have distributed, offer for sale, have offered for sale, sell and have sold Compound and Products for any diagnostic use in the Territory.

2.3 Sublicense Under Roche Third Party Agreements

Roche hereby grants to GBT an exclusive (even as to Roche) sub-license of the rights licensed to Roche under the [***] and [***] solely to develop, have developed, commercialize, have commercialized, make, have made, use, have used, sell, have sold, offer for sale, have offered for sale, import and have imported Compound and Product in the Field in the Territory. The sublicense granted under this Section 2.3 shall be subject to the rights and obligations and undertakings of Roche, as applicable, under the [***] and [***] (a copy of which, including all amendments, with reasonable redactions that are not related to the rights granted hereunder, the obligations of GBT with respect to such sublicense, or payment obligations pursuant to Section 10.7, is attached hereto as Appendix 2.3, and incorporated herein by reference). Roche shall act as the sole direct contact with [***] and [***] in relation to the sub-license under this Section 2.3. GBT shall on a case-by-case basis and upon Roche's prior approval have the right to communicate directly with [***] and [***] (as applicable) with respect to payments to [***] and [***] (as applicable) which arise based upon the activities of GBT under this Agreement, and for which Roche is obligated to pay to [***] or [***] pursuant to Section 10.7. GBT shall promptly notify Roche of any such communications between [***] or [***] (as applicable) and GBT. Roche shall have the right to attend any meeting of GBT with [***] or [***] (as applicable).

Where there is an inconsistency between the rights granted to GBT by Roche under this Agreement and the rights Roche is entitled to grant to GBT pursuant to the terms of the [***] and the [***] as disclosed in Appendix 2.3, the respective terms of the [***] and the [***] shall govern over the terms of this Agreement. In the event of any such inconsistency, (i) Roche shall promptly notify GBT of such inconsistency upon learning thereof, (ii) the Parties will cooperate in good faith to resolve such inconsistency and (iii) such inconsistency shall not be interpreted as a material breach of this Agreement by either Party.

GBT shall comply with the terms of the [***] and [***] to the extent such terms are disclosed in Appendix 2.3 and are applicable to GBT as a sublicensee under such agreements.

Roche shall not do (or fail to do) anything that constitutes a breach under the [***] or [***] (as applicable) entitling [***] or [***] (as applicable) to terminate or otherwise narrow the rights granted under the [***] or [***] (as applicable) with respect to the Compound. Roche shall not terminate or amend the [***] and [***] in a manner that adversely affects any sub-licenses hereunder, and shall maintain in effect the [***] and [***] with respect to the Compound and/or the Product. Roche shall provide copies of any amendments to the [***] and [***] (with reasonable redactions of provisions of such amendment that are not related to the rights granted hereunder, the obligations of GBT with respect to such sublicense or the payment obligations pursuant to Section 10.7) to GBT once executed, as well as copies of any termination notice with respect to the Compound and Product under the [***] or [***]. If the [***] or [***] nonetheless is terminated with respect to the Compound and Products (for any reason), Roche shall use commercially reasonable efforts to seek to reinstate or maintain GBT's rights thereunder.

2.4 Right to Sublicense to its Affiliates

GBT shall have the right to grant written sublicenses to its Affiliates under its rights granted under Sections 2.1 and 2.3. If GBT grants such a sublicense, GBT shall ensure that all of the applicable terms and conditions of this Agreement shall apply to all such Affiliates to the same extent as they apply to GBT for all purposes. GBT assumes full responsibility for the performance of all obligations and observance of all terms so imposed on such Affiliates and shall itself account to Roche for all payments due under this Agreement by reason of such sublicense.

2.5 Right to enter into Partner Agreements

Subject to Roche's rights under Article 3, GBT shall have the right to enter into one (1) or more Partner Agreements sub-licensing the rights and licenses granted by Roche to GBT under Sections 2.1 and 2.3 in the Territory, subject to Roche's rights under Article 3 and rights under this Section 2.5. GBT will be responsible for managing the Partner process including scientific due diligence and negotiations.

If GBT grants such rights to the Partner(s), GBT shall ensure that the Partner(s) comply with all of the applicable terms and conditions of this Agreement, including the obligations under the [***] and the [***] as disclosed in Appendix 2.3, to the same extent as they apply to GBT for all applicable purposes. GBT shall remain liable to Roche for the performance of all obligations and observance of all terms so imposed on a Partner under such Partner Agreement(s) and shall itself account to Roche for all payments due under this Agreement.

Prior to entering into a Partner Agreement, GBT shall provide Roche with a draft Partner Agreement which may be redacted with respect to any terms not related to the Compound or Product, and, promptly following execution, with the final similarly redacted version of the executed copy of such Partner Agreement. The right to sublicense under this Section 2.5 shall be subject to Roche's prior written approval of the Partner and the terms of the draft Partner Agreement, not to be unreasonably withheld, conditioned or delayed. Roche shall not withhold its approval, unless Roche reasonably believes that the economic terms of the Partner Agreement worsen its economic position as set forth under this Agreement or it becomes public that the proposed Partner is or will be subject to material compliance related sanctions. If Roche withholds its approval, Roche shall provide the reasoning of such withholding of approval to GBT. If, after good faith negotiations not to exceed [***], the Parties cannot settle any dispute as to whether Roche has unreasonably withheld its approval of the Partner and/or the terms of the Partner Agreement, the dispute shall be initially referred to the executive officers of the Parties in accordance with Section 22.2. Should the Parties' executive officers fail to agree within [***] of such referral, then, notwithstanding Section 22.3, the dispute shall be settled by arbitration under the procedures of Sections 22.3-22.5.

Any Partner Agreement shall include (i) the right to disclose a redacted copy of the Partner Agreement and the Partner's confidential information to Roche as necessary for Roche to ensure compliance with the terms of this Agreement and (ii) the right of Roche to disclose a redacted copy of the Partner Agreement and Confidential Information to [***] and/or [***] to the extent required under the [***] and/or [***] (as applicable), protected by the confidentiality terms thereof.

The Partners of GBT shall have the right to further sub-license rights to its Affiliates as provided in Section 2.4, and to sub-license rights to develop and commercialize the Compound or Product to a Third Party with Roche's prior written consent, which shall not be unreasonably withheld, conditioned or delayed, in accordance with the terms of and process described in this Section 2.5 (applied *mutatis mutandis* to such further sub-license in place of a Partner Agreement).

As a general principle, a Partner Agreement (including tier 1 and subsequent tiers of sub-licensing) shall not be structured in a way to avoid payments to Roche otherwise due to Roche under Section 10.8.

For example: GBT shall not enter into a Partner Agreement that allocates certain payments to a product other than a Product, where such payments are materially inconsistent with the relative values of the Product and such other product and the rights granted with respect to each such product, for the purpose of avoiding payments to Roche under Section 10.8.

2.6 Sub-Contractors

GBT has the right to sub-contract the work performed in connection with this Agreement, including, without limitation, entering into one or more agreements with any contract organization for research, development, manufacturing and/or sales (including any commercial distribution agreement). GBT shall inform Roche if GBT or any Third Party acting on behalf of GBT sub-contracts the manufacture of the Compound or Product. Any sub-contract agreement for the manufacture of the Compound and Product shall include (i) the right to disclose a copy of such sub-contract agreement and confidential information disclosed thereunder, which will be GBT's Confidential Information under this Agreement, to Roche and (ii) the right to assign the agreement to Roche upon Roche's having obtained rights to the Compound and Product either as a result of the exercise of its Right of First Negotiation pursuant to Article 3 or upon termination of this Agreement, including the right to transfer the ownership of data, information and results arising therefrom to Roche to the same extent as to GBT.

2.7 Retained Rights

Notwithstanding anything in this Agreement, Roche and its Affiliates shall retain the right to use the Compound for internal, non-clinical research purposes in the Field. Roche's right to publish data resulting from such internal research shall depend upon GBT's prior written consent, which GBT may grant or withhold in its sole discretion.

3. Right of First Negotiation

3.1. Due Diligence

If GBT, at any time during the Agreement Term, intends to enter into a Partner Agreement:

(i) granting rights [***]; or

(ii) granting rights [***]

GBT shall promptly inform Roche in writing of such intention, including the [***] (the "**GBT Notice**").

In the event that GBT has given Roche a GBT Notice pursuant to the first paragraph of this Section 3.1, GBT shall without delay prepare the Data Room and upon such Data Room being available, GBT shall promptly inform Roche in writing thereof and give Roche access to the Data Room and provide Roche with an executive summary report on the development, manufacture and commercialization of the Compound or Product (the "**Review Notice**").

Roche shall have the right to review the information in the Data Room and perform due diligence during a [***] period, such period commencing the later of (i) Roche's access to the Data Room or (ii) [***] after the date of the GBT Notice (the "**Initial Review Period**"). By the end of the Initial Review Period, Roche will notify GBT in writing whether or not Roche is interested in exercising its rights under Section 3.2 or 3.3 with respect to the [***].

Notwithstanding the foregoing, to the extent GBT has provided notice of its intention of entering into a [***], Roche shall have the right to express its interest in the Roche Indication of Interest in negotiating instead for a [***], and GBT shall be obliged to entertain such Roche Indication of Interest for a [***].

If the Roche Indication of Interest indicates that Roche is not interested in a [***] then Roche shall be deemed to have waived its rights under this Article 3 as to the [***] that are the subject of the GBT Notice, and GBT shall have, subject to the terms set forth in Section 3.2 and 3.3, the right to enter into the [***] with a Third Party. Any Partner Agreement shall be subject to Roche's prior consent as provided in Section 2.5.

3.2 [***]

This Section 3.2 will apply if

(i) GBT notifies Roche in the GBT Notice that it intends to enter into a [***] or

(ii) GBT notifies Roche in the GBT Notice that it intends to enter into a [***] and Roche expresses its interest in the Roche Indication of Interest in negotiating a [***] for the [***] pursuant to Section 3.1.

GBT hereby grants to Roche an exclusive right (the "**Exclusive Right of First Negotiation**") to negotiate in good faith the terms and conditions upon which GBT would revert back to Roche the rights to the Compound and Products with regard [***]: i.e. the terms and conditions under which the following would be in effect:

(i) all rights and licenses granted by Roche to GBT under this Agreement would terminate with regard to the [***] and GBT would return all such rights and licenses to Roche; and

(ii) one of the following alternatives would come into effect:

(a) GBT would sell and assign to Roche all GBT Patent Rights, GBT's interest in Joint Patent Rights, and GBT Know-How, and GBT's interest in Joint Know-How, with regard to the [***]; or

(b) GBT would grant to Roche an exclusive (even as to GBT), sub-licensable license under the GBT Patent Rights, GBT's interest in Joint Patent Rights, and GBT Know-How, and GBT's interest in Joint Know-How, with regard to the [***] to develop, have developed, make, have made, use, have used, manufacture, have manufactured, import, have imported, offer for sale and have offered for sale, sell and have sold Compound and Products in the Field in the [***].

If Roche delivers a Roche Indication of Interest for a [***], Roche shall have the right to review the Data Room and the Parties shall discuss the opportunity in good faith for up to [***] from the date of the Roche Indication of Interest (the "**Additional Review Period**"). During the Additional Review Period representatives of Roche shall have at reasonable times the opportunity to ask questions of and receive answers from representatives of GBT related to the Product and the program. GBT shall respond to Roche's reasonable inquiries in a timely fashion and without delay and shall not withhold any material information from Roche in response to Roche's inquiries or otherwise in connection with the Product and the program.

Roche shall have the right to exercise the Exclusive Right of First Negotiation with regard to the [***] at any time during the Additional Review Period by providing written notice to GBT (the "**ROFN Exercise Notice**").

Together with the ROFN Exercise Notice, Roche shall provide GBT a written offer for the terms and conditions upon which GBT would revert back to Roche the rights to the Compound and Products with regard to the [***] as described above in this Section 3.2 in form of a draft term sheet, and the Parties thereafter shall have up to [***] to exclusively and in good faith negotiate the terms and conditions of such reversion of rights with regard to the [***] in form of a final term sheet (the "**Term Sheet**").

Upon finalization of the Term Sheet, the Parties shall have a further period of up to [***] to exclusively and in good faith negotiate and finalize the respective definitive agreement(s) with respect to such reversion of rights (the "**Reverse Agreement**").

The term "**Negotiation Period**" shall mean the period of time commencing on the date of Roche's ROFN Exercise Notice and ending either (i) [***] after such exercise in the case where the Parties fail to execute a mutually agreed upon Term Sheet during such period; or (ii) [***] after such exercise in the case where the Parties could initially agree on the Term Sheet but fail to enter into the Reverse Agreement.

If (i) Roche declines to access the Data Room during the Initial Review Period, (ii) Roche during the Additional Review Period or the Negotiation Period, if any, confirms in writing to GBT that it is not interested in having the rights to the Compound and the Products revert back to it with regard to the [***] as described above in this Section 3.2 or (iii) the Parties, after good faith discussions during the relevant part of the Negotiation Period, cannot agree on the Term Sheet or fail to enter into the Reverse Agreement, then GBT shall be free to start negotiations and enter into a Partner Agreement with a Third Party with regard to the [***]. Notwithstanding the foregoing, if the Parties have failed to agree on a Term Sheet or the Reverse Agreement during the applicable Negotiation Period, then – subject to the last paragraph of this Section 3.2.—GBT shall be free to start negotiations and enter into a Partner Agreement with respect to the [***] (but subject to Roche's prior consent as provided in Section 2.5), provided that during the [***] period after the end of the applicable Negotiation Period with Roche, [***].

If GBT does not enter into a Partner Agreement for the [***], but continues the development and commercialization of the Compound and Products with regard to the [***], then this Section 3.2 shall apply *mutatis mutandis* at any time during the Agreement Term, if GBT at any later point in time intends again to enter into a [***] with regard to the same country(ies) and has completed a [***] (e.g., if a [***]).

3.3 Country Agreement

This Section 3.3 will apply if GBT notifies Roche in the GBT Notice that it intends to enter into a [***] and Section 3.2 does not apply.

GBT hereby grants to Roche a non-exclusive right to negotiate in good faith the terms and conditions upon which GBT would revert back to Roche the rights to the Compound and Products with regard to the [***] GBT is intending to grant to a Partner (the [***], i.e., the terms and conditions under which the following would be in effect:

(i) all rights and licenses granted by Roche to GBT under this Agreement would terminate with regard to the [***] only and GBT would return all such rights and licenses to Roche; and

(ii) one of the following alternatives would come into effect:

(a) GBT would sell and assign to Roche all GBT Patent Rights, GBT's interest in Joint Patent Rights and GBT Know-How, and GBT's interest in Joint Know-How, with regard to the [***]; or

(b) GBT would grant to Roche an exclusive (even as to GBT), sub-licensable license under the GBT Patent Rights, GBT's interest in Joint Patent Rights, and GBT Know-How, and GBT's interest in Joint Know-How, with regard to the [***] to develop, have developed, make, have made, use, have used, manufacture, have manufactured, import, have imported, offer for sale and have offered for sale, sell and have sold Compound and Products in the Field in the [***].

If Roche is interested in having the rights to the Compound and Products revert back to it with regard to the [***], Section 3.2 shall apply *mutatis mutandis*, except that the Additional Review Period will be [***] and the Negotiation Period will be up to [***] to negotiate a Term Sheet and up to [***] to negotiate the Reverse Agreement; provided that if (i) Roche declines to access the Data Room during the Initial Review Period, (ii) Roche during the Additional Review Period or the Negotiation Period, if any, confirms in writing to GBT that it is not interested in having the rights to the Compound and Products revert back to it with regard to the [***] as described in this Section 3.3 or (iii) the Parties, after good faith discussions during the Negotiation Period, cannot agree on the Term Sheet or fail to enter into the Reverse Agreement, then GBT shall be free to enter into a Partner Agreement with a Third Party with regard to the [***], regardless of the terms of such Partner Agreement.

Notwithstanding the foregoing, if [***], then the Additional Review Period and the Negotiation Period under this Section 3.3 will be the same duration as the Additional Review Period and the Negotiation Period under Section 3.2.

4. Alliance Managers and Technology Transfer

4.1 Alliance Managers

[***]

4.2 Roche Know-How Transfer

Promptly, but not later than [***] after the Effective Date, Roche shall transfer to GBT the Roche Know-How listed in Appendix 1.54 A), [***]. Such Roche Know-How transfer shall occur electronically after the Effective Date by granting GBT download rights to the electronic database for a period of [***] from the Effective Date. If GBT identifies a need for additional Know-How of Roche during such period of [***] from Effective Date, GBT shall notify Roche, and [***], provided that such Know-How still exists and is reasonably retrievable by Roche.

If GBT after the [***] period identifies during the following [***] a need for additional Know-How of Roche relating to the Compound, GBT shall notify Roche, and Roche will transfer such Know-How to GBT with Roche's personnel time to conduct such transfer charged to GBT at Roche's standard commercial rate applicable at the time, provided that such Know-How (i) does not include any general Roche technology containing intellectual property Roche would otherwise license with financial terms, (ii) still exists and (iii) is reasonably retrievable by Roche.

4.3 Transfer of Regulatory Filings

Roche shall take such actions as reasonably necessary to transfer to GBT copies of any regulatory filings such as all IND related documents and all documents related to other filings and correspondence with or to and from any Regulatory Authority with respect to the Compound or Products (collectively, "**Transfer**"), and shall take such actions as may be necessary to inform Regulatory Authorities of this Transfer. Roche hereby grants to GBT a right of cross-reference to all regulatory materials filed by Roche or its Affiliates in the Territory related to the Compound or any Product, for the purpose of seeking, obtaining and maintaining Regulatory Approvals for, and the commercialization of, Products in the Field in the Territory. Roche shall take all actions reasonably requested by GBT to enable GBT to exercise such right of cross-reference. All activities contemplated by this Section 4.3 shall be conducted by Roche at no cost to GBT.

Promptly, but no later than [***] after the Effective Date, Roche shall transfer to GBT the latest available version of the Clinical Investigator's Brochure, all final pre-clinical and clinical study reports and clinical study protocols, all clinical data and all relevant historical clinical safety data (safety information on serious adverse events shall be provided in CIOMS format and Safety information on non-serious adverse events shall be provided in English Line Listing format, subject to safety data transfer as set forth in Section 8.3) at no charge to GBT.

4.4 No Further Obligations

Roche shall have no obligation to transfer any Know-How, materials, regulatory filings or to provide technical support other than expressly stated in this Article 4.

For clarity, [***].

5. Diligence

GBT shall use Commercially Reasonable Efforts to develop and commercialize the Compound and Products in the Field in the Territory.

6. Development

6.1 Responsibility

GBT shall be solely and exclusively responsible at its own expense for the non-clinical and clinical development of the Product in the Field in the Territory.

6.2 Development Plan

GBT will conduct the development of the Compound and Products in the Field in the Territory in accordance with a written plan ("**Development Plan**"). The initial version of the Development Plan is attached in Appendix 6.2. GBT shall send to Roche a then current version of the Development Plan and a report describing in sufficient detail the development progress of the Products at the end of December annually for so long as there is a Product in development.

If GBT wishes to modify the manufacturing process of the Compound or the Product resulting in [***], then GBT shall provide written notice to Roche of the nature of such intended work.

7. Supply

GBT (on its own and/or using Third Party manufacturers) shall be solely and exclusively responsible at its own expense for the manufacture and supply of clinical and commercial supplies of the Product. GBT shall supply at its own cost all clinical, non-clinical and commercial supply of Product during the Term, either by itself, or through a Third Party.

8. Regulatory

8.1 Responsibility

Except as provided in Section 4.3, GBT shall be solely and exclusively responsible at its own expense for all regulatory affairs related to Products in the Field in the Territory, including the preparation, filing and maintaining of applications for Regulatory Approval, as well as any or all governmental approvals required to develop, have developed, make, have made, use, have used, import, have imported, sell and have sold Compound and Products. GBT shall be solely and exclusively responsible for pursuing, compiling and submitting all regulatory filing documentation, and for interacting with regulatory agencies, for Compound and Products in all countries in the Territory. GBT shall own and file in its own discretion all regulatory filings and Regulatory Approvals for the Compound and Product in all countries of the Territory.

8.2 Informed Consent Forms

Any informed consent forms with study subjects under any GBT study or any of its Partner studies for the Product shall include the right to transfer samples, data and information from such study to a third party (such as Roche) if the rights to develop the Product are transferred to such third party.

8.3 Pharmacovigilance Agreement and Safety Data

Within [***] after the Effective Date, Roche shall transfer to GBT the historical safety data for Compounds and Products.

The Parties do not as of the Effective Date believe that a Pharmacovigilance Agreement will be necessary, but if the Parties agree after the Effective Date that such agreement is applicable, GBT and Roche shall negotiate in good faith and enter into a Pharmacovigilance Agreement in accordance with all Applicable Laws which sets forth, among other things, the responsibilities and obligations of the Parties with respect to the procedures and timeframes for compliance with all Applicable Laws (and each of the Party's policies) pertaining to safety reporting and their related activities, with respect to activities related to the Products under this Agreement.

9. Commercialization

9.1 Responsibility

GBT shall be solely and exclusively responsible at its own expense, for the marketing, promotion, sale and distribution of Product(s) in the Territory.

9.2 Reporting and Updates

After the First Commercial Sale of a Product and until the expiry of the Agreement Term, GBT shall inform Roche in an annual report regarding the commercialization of Product(s) in the Field in the Territory by GBT, its Affiliates and Sublicensees in the preceding year. The first such annual report shall be provided within [***] after the end of the Calendar Year containing the First Commercial Sale. Each subsequent annual report shall be provided within [***] after the end of each Calendar Year thereafter until the expiration of all Royalty Terms. Each annual report shall include non-binding [***] sales projections (which may be expressed as a reasonable range), within [***] of the end of each Calendar Year thereafter until the expiration of all Royalty Terms.

In addition to the foregoing, upon reasonable request of Roche, GBT shall update Roche regarding the commercialization of the Product(s) in the Territory in the Field by GBT, its Affiliates and Sublicensees. Upon such reasonable request of Roche, GBT shall provide an update, in writing and/or through a meeting (face to face/ tele-presence/videoconference or telephone). Roche shall not request an update more frequently than [***].

10. Payment

10.1 Upfront Payment

Within [***] after the Effective Date, GBT shall pay to Roche two million US Dollars (US$2,000,000). This payment shall be non-refundable.

10.2 Development Event Payments

GBT shall pay to Roche up to a total of fifty nine million, seven hundred fifty thousand US Dollars (US$59,750,000) in relation to the achievements of (i) the development events as described in the following schedule for any Product that achieves such event in Lead Indication first and (ii) the development events as described in the following schedule for any Product that achieves such event in Other Indication(s) first. For clarity, GBT shall pay to Roche up to forty million, five hundred thousand US Dollars (US$40,500,000) for achievement of the events in the Lead Indication and nineteen million, two hundred fifty thousand US Dollars (US$19,250,000) for achievement of the events in the Other Indication(s)).

GBT shall pay Roche (i) the development event payment number 1 set forth below one time irrespective of the indication, (ii) the development event payments listed in the column entitled “Lead Indication” for the events described in number 2, 3, 4, 5 and 6 set forth below once upon achieving the respective event in the Lead Indication, and (iii) the development event payments listed in the column entitled “Other Indication(s)” for the events described in number 2, 3, 4, 5 and 6 set forth below once for any Product that first achieves such event in Other Indication(s).

The development event payments shall be non-refundable.

Development Event	Lead Indication (US Dollars)	Other Indication(s) (US Dollars)
1. [***]	[***]	
2. [***]	[***]	[***]
3. [***]	[***]	[***]
4. [***]	[***]	[***]
5. [***]	[***]	[***]
6. [***]	[***]	[***]

Example for Lead Indication: If the development event number 2 for a Product for the Lead Indication has not been achieved but thereafter the development event number 3, 4, 5, or 6 is achieved for a Product in the Lead Indication, then the development number 2 payment will be due at the same time as the payment for the development event number 3, 4, 5 or 6, whichever is achieved first, becomes due.

Example for Other Indication(s): If the development event number 2 for a Product for an Other Indication has not been achieved but thereafter the development event number 3, 4, 5, or 6 is achieved for a Product in an Other Indication, then the development number 2 payment will be due at the same time as the payment for the development event number 3, 4, 5 or 6, whichever is achieved first, becomes due.

If GBT [***] GBT shall pay the development event payment number 2 of [***] US Dollars (US$[***]) to Roche. If GBT [***], then the development event payment number 2 does not become due a second time. If [***], then GBT shall pay the development event payment number 3 of [***] US Dollars (US$[***]) to Roche.

Upon reaching development events, GBT shall timely notify Roche and development event payments shall be paid by GBT to Roche within [***] from occurrence of the applicable event and receipt of an invoice from Roche.

10.3 Sales Based Events

GBT shall pay to Roche up to a total of eighty five million US Dollars (US$85,000,000) based on aggregate Calendar Year Net Sales of all Products in the Territory:

Net Sales Threshold	Payment
Total Calendar Year Net Sales in the Territory of Products exceed US$[***]	US$ [***]
Total Calendar Year Net Sales in the Territory of Products exceed US$[***]	US$ [***]
Total Calendar Year Net Sales in the Territory of Products exceed US$[***]	US$ [***]

* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

Each of the sales based event payments shall be paid no more than once during the Agreement Term, at first occurrence of the event for aggregated sales of all Products in the Territory first reaching the respective Net Sales threshold, and shall be non-refundable and non-creditable. On a quarterly basis during each Calendar Year of the Royalty Term, within the [***] period set forth in Section 11.1 for GBT's calculation and payment of royalties for the first, second, third and fourth quarters of a Calendar Year, GBT shall calculate whether any sales threshold under this Section 10.3 has been achieved in a given quarter, and if so shall notify and pay Roche any such achieved sales based event payment that accrues in such quarter, within the same time frames set forth in Section 11.1 for royalty payments.

10.4 Royalty Payments

10.4.1 Royalty Term

Royalties shall be payable by GBT on Net Sales of Product(s) on a Product-by-Product and country-by-country basis until the expiry of the Royalty Term for such Product and country. Thereafter, the licenses with respect to such Product and country shall be fully paid up, perpetual, irrevocable and non-exclusive.

10.4.2 Royalty Rates

The following royalty rates shall apply to the respective tiers of aggregate Calendar Year Net Sales of all Products, on an incremental basis, as follows:

Tier of Calendar Year Net Sales in million US$	**Percent (%) of Net Sales**
[***]	[***]
[***]	[***]
[***]	[***]

For example, if Net Sales of Products in the Territory, for a given Calendar Year, are US$[***] million, then royalties owed to Roche on such Net Sales of Products for that Calendar Year shall equal US$[***] calculated as follows:

[[***]] = US$[***] royalty payment

10.5 Combination Product

If GBT or its Affiliates or Sublicensees intend to sell a Combination Product, then the Parties shall meet approximately [***] prior to the anticipated First Commercial Sale of such Combination Product in the Territory to negotiate in good faith and agree to an appropriate adjustment to Net Sales to reflect the relative commercial value contributed by the components of the Combination Product (the "**Relative Commercial Value**"). If, after such good faith negotiations not to exceed [***], the Parties cannot agree to an appropriate adjustment, the dispute shall be initially referred to the executive officers of the Parties in accordance with Section 22.2. Should the Parties fail to agree within [***] of such referral, then the Relative Commercial Value shall be determined by an Expert Committee under the procedures of Section 10.6.

10.6 Expert Committee

If the Parties are unable to agree on the Relative Commercial Value under Section 10.5, then Roche will select one (1) individual who would qualify as an Expert, GBT will select (1) individual who would qualify as an Expert, and those two (2) individuals shall select one (1) individual who would qualify as an Expert and who shall be chairman of a committee of the

three Experts (the "**Expert Committee**"), each with a single deciding vote. The Expert Committee will promptly hold a meeting to review the issue under review, at which it will consider memoranda submitted by each Party at least [***] before the meeting, as well as reasonable presentations that each Party may present at the meeting. The determination of the Expert Committee as to the issue under review will be binding on both Parties. The Parties will share equally in the costs of the Expert Committee. Unless otherwise agreed to by the Parties, the Expert Committee may not decide on issues outside the scope mandated under terms of this Agreement.

10.7 Third Party Payments

GBT shall be responsible for and pay or have paid any and all consideration owed to any Third Party in relation to Third Party intellectual property rights related to any Compound or Product under which GBT obtains a license. Payments under the [***] and the [***] shall be paid according to the following paragraphs.

Roche shall be responsible in the first instance for the payment of all payments under the [***] and the [***], provided however that GBT shall, (a) prior to the date upon which any milestone payments are due under the [***] and the [***], pay to Roche an amount equal to such milestone payment, which Roche shall use solely for the purposes of paying the milestones due to [***] or [***] (as applicable), and (b) along with the royalties GBT owes to Roche pursuant to Section 10.4 and to be paid in accordance with Section 11.1, pay to Roche an amount equal to the royalties, if any, due under the [***] and the [***] based upon the same sales, which Roche shall use solely for the purposes of paying such royalties to [***] or [***] (as applicable) and for no other purpose. GBT shall on a country-by-country basis have the right to deduct a maximum of [***] percent ([***]%) of the royalties paid to Roche in accordance with clause (b) of the foregoing sentence from royalty payments otherwise due and payable by GBT to Roche under this Agreement. Any such deduction will only be permitted for Third Party obligations under the [***] and the [***]. In no event shall the amount of royalties payable to Roche for a given Calendar Year pursuant to Section 10.4 become reduced by more than [***] percent ([***]%) of the royalty otherwise due to Roche under Section 10.4 ("**Deduction Cap**") on account of such deduction, and GBT shall have the right to carry forward to subsequent Calendar Quarters any amounts in could not deduct on account of the Deduction Cap. Roche shall timely provide all information to GBT that is necessary for GBT (or otherwise reasonably requested) to determine the amounts owed by Roche under the [***] and the [***] and to be paid to Roche as provided above.

10.8 Strategic Transaction

10.8.1 Payments under Net Proceeds

For each Strategic Transaction consummated, GBT or the Change of Control Group (as applicable) shall, on an incremental basis, pay to Roche the following amounts of any Net Proceeds as and when such Net Proceeds are received:

(a) [***] percent ([***]%) of the aggregate Net Proceeds from all Strategic Transactions up to the [***] US Dollars (US$[***]) in Net Proceeds received from all Strategic Transactions;

(b) [***] percent ([***]%) of the aggregate Net Proceeds from all Strategic Transactions in excess of [***] US Dollars (US$[***]) and up to [***] US Dollars (US$[***]) in Net Proceeds received from all Strategic Transactions;

(c) [***] percent ([***]%) of the aggregate Net Proceeds from all Strategic Transactions in excess of [***] US Dollars (US$[***]) in Net Proceeds received from all Strategic Transactions (sub-sections (a), (b) and (c) together, "**Strategic Transaction Revenues**").

The following examples shall illustrate the principle:

- For example, if GBT enters into a Strategic Transaction and receives US$[***] as Net Proceeds, then Strategic Transaction Revenues owed to Roche on such Strategic Transaction shall equal US$[***] calculated as follows:

  [***] = US$[***] Strategic Transaction Revenues

- For example, if GBT (a) enters into a first Strategic Transaction (Partner Agreement) and receives US$[***] as Net Proceeds and (b) subsequently enters into a second Strategic Transaction (Change of Control) and receives US$[***] as Net Proceeds, then Strategic Transaction Revenues owed to Roche on both Strategic Transactions together shall equal US$[***] calculated as follows:

  [***] = US$[***] Strategic Transaction Revenue

A Strategic Transaction shall not be structured to avoid payments to Roche otherwise due to Roche under this Agreement. Consideration that Roche receives pursuant to this Section 10.8.1 is in addition to the upfront payment, development event payments, sales based event payments and royalty payments pursuant to Sections 10.1, 10.2, 10.3 and 10.4 above with no right of offset (but subject to any adjustment to royalties that are included in Net Proceeds as provided in the definition of Net Proceeds).

For the avoidance of doubt, should GBT enter into multiple Strategic Transactions, then the Net Proceeds of all such Strategic Transactions shall be considered on an aggregate basis, as and when received, for the purpose of calculating Strategic Transaction Revenues pursuant to this Section 10.8.1.

10.8.2 Timing

GBT or the Change of Control Group (as applicable) shall calculate the Strategic Transaction Revenues owed under Section 10.8.1 for each Calendar Quarter in which the applicable Net Proceeds are received according to the terms and conditions of the Strategic Transaction, and shall make such payments to Roche consistent with the timeframes for royalty payments set forth in Section 11.1.

10.8.3 Value of Net Proceeds

If at the time of the closing of a Strategic Transaction GBT owns or controls (whether through a license or otherwise) other assets or rights in addition to the Compound or Product rights that are subject of the Strategic Transaction ("**Additional Assets**"), then the Parties shall negotiate and agree in good faith the value of the Net Proceeds, exclusive of the value attributed to the Additional Assets. If after good faith negotiations, the Parties cannot agree on an allocation of value between the Additional Assets and the Compound and Product rights within [***] after the closing of a Strategic Transaction, then the dispute shall be initially referred to the executive officers of the Parties in accordance with Section 22.2. Should the Parties fail to agree within [***] of such referral, then Roche shall select an independent, neutral, internationally recognized investment banking, accounting or valuation firm having expertise in the pharmaceutical industry and reasonably acceptable to GBT ("**Valuation Firm**") to perform an independent valuation of the Additional Assets and the Compound and Product rights, which determination shall be final and binding on the Parties. The Valuation Firm shall be requested to determine the allocation of the value between such assets within [***] of its appointment and to notify the Parties in writing of its determination. The fees and expenses of such Valuation Firm shall be paid by Roche, and shall be independent of the results of its valuation, however, if such determination of the value of the Net Proceeds by the Valuation Firm is more than [***] percent ([***]%) of GBT's last written offer pursuant to the good faith negotiations under this Section 10.8.3, the fees and expenses of such Valuation Firm shall be paid by GBT.

This Section 10.8.3 does not apply if GBT closes the Strategic Transaction and the Compounds and Products are the only assets owned or controlled by GBT at the time of the Strategic Transaction. In such case, the value associated with the Compounds and Products is one hundred percent (100 %) of the Net Proceeds.

11. Accounting and reporting

11.1 Timing of Payments

GBT shall calculate royalties on Net Sales quarterly as of March 31, June 30, September 30 and December 31 (each being the last day of an "**Accounting Period**") and shall pay royalties on Net Sales within [***] after the end of each Accounting Period in which such Net Sales occur.

11.2 Late Payment

Any payment under this Agreement that is not paid on or before the date such payment is due shall bear interest, to the extent permitted by Applicable Law, at an annual rate of [***] above the average one-month Euro Interbank Offered Rate (EURIBOR), as reported by Reuters from time to time, calculated on the number of days such payment is overdue.

11.3 Method of Payment

Royalties on Net Sales and all other amounts payable by GBT hereunder shall be paid by GBT in US$ to account(s) designated by Roche.

11.4 Currency Conversion

When calculating the Net Sales of any royalty-bearing Product that occur in currencies other than US$, GBT shall convert the amount of such sales into US$ using GBT's then-current internal foreign currency translation actually used on a consistent basis in preparing its audited financial statements.

11.5 Reporting

With each payment GBT shall provide Roche in writing for the relevant Calendar Quarter on a Product-by-Product basis the following information:

a) Invoice sales in local currency on a country-by-country basis;

b) Net Sales in local currency on a country-by-country basis;

c) Net Sales in US$ on a country-by-country basis;

c) adjustments made pursuant to Section 10.5 on a country-by-country basis;

d) Net Sales in US$ after adjustments made pursuant to Section 10.5;

e) exchange rate used for the conversion of local currency into USD$ pursuant to Section 11.4;

f) royalty rate(s) pursuant to Section 10.4.2;

g) total royalty payable in US$ after applying any deductions under Section 10.7; and

h) true-up of gross-to-net accruals relating to prior quarters.

12. Taxes

Roche shall pay all sales, turnover, income, revenue, value added, and other taxes levied on account of any payments accruing or made to Roche under this Agreement.

If provision is made in law or regulation of any country for withholding of taxes of any type, levies or other charges with respect to any royalty or other amounts payable under this Agreement to Roche, then GBT shall promptly pay such tax, levy or charge for and on behalf of Roche to the proper governmental authority, and shall promptly furnish Roche with receipt of payment. GBT shall be entitled to deduct any such tax, levy or charge actually paid from royalty or other payment due to Roche or be promptly reimbursed by Roche if no further payments are due to Roche. Each Party agrees to reasonably assist the other Party in claiming exemption from such deductions or withholdings under double taxation or similar agreement or treaty from time to time in force and in minimizing the amount required to be so withheld or deducted.

13. Auditing

13.1 Roche Right to Audit

GBT shall keep, and shall require its Affiliates and Sublicensees to keep, full, true and accurate books of account containing all particulars that may be necessary for the purpose of calculating all (i) Net Sales and royalties payable under this Agreement and (ii) Net Proceeds. Such books of accounts shall be kept at their principal place of business. At the expense of Roche, Roche has the right to appoint one of the major public accountant firms to perform, on behalf of Roche an audit of such books and records of GBT and its Affiliates and Sublicensees, that are deemed necessary by the major public accountant firm to report on (i) Net Sales of Product, royalty calculations, royalty payments and payments under the aggregate Net Proceeds for the period(s) requested by Roche and the (ii) the correctness of any financial report or payments made under this Agreement.

Upon timely request and at least [***] prior written notice from Roche, such audit shall be conducted in the countries specifically requested by Roche, during regular business hours in such a manner as to not unnecessarily interfere with GBT's or its Sublicensees' normal business activities, and shall be limited to results in the [***] full Calendar Years prior to audit notification.

Such audit shall not be performed more frequently than once per Calendar Year nor more frequently than once with respect to records covering any specific period of time.

All information, data, documents and abstracts herein referred to shall be used only for the purpose of calculating all (i) Net Sales and royalties payable under this Agreement and (ii) Net Proceeds, shall be treated as GBT's Confidential Information subject to the obligations of this Agreement and need neither be retained more than [***] after completion of an audit hereof, if an audit has been requested; nor more than [***] from the end of the Calendar Year to which each shall pertain; nor more than [***] after the date of termination of this Agreement.

13.2 Audit Reports

The auditors shall only state factual findings in the audit reports and shall not interpret the agreement. The final audit report shall be shared with GBT at the same time it is shared with Roche.

13.3 Over-or Underpayment

If the audit reveals an overpayment in excess of US$[***], Roche shall reimburse GBT for the amount of the overpayment within [***]. If the audit reveals an underpayment in excess of US$[***], GBT shall make up such underpayment with the next royalty payment or other payment, or if no further royalty payments or other payments are owed to Roche, GBT shall reimburse Roche for the amount of the underpayment within [***]. [***] exceeds the greater of US$[***] or [***] percent ([***]%) of the [***]. Section 11.2 (Late Payment) shall apply to this Section 13.3.

14. Intellectual Property

14.1 Ownership of Inventions

GBT shall solely own all GBT Inventions and Joint Inventions. Roche shall solely own all Roche Inventions. GBT and Roche each shall require all of its employees to assign all inventions related to Products made by them to Roche and GBT, as the case may be.

The determination of inventorship for Inventions shall be in accordance with US inventorship laws.

Any GBT Invention in connection with the performance of this Agreement relating to Compound or Product shall be the exclusive property of GBT.

Roche's interest in any Joint Invention in connection with the performance of this Agreement relating to Compound or Product shall be the exclusive property of GBT. Roche hereby assigns to GBT all of its right, title and interest in and to the Joint Inventions. Roche shall promptly sign and deliver any and all documents or information necessary for the transferring of ownership rights and/or securing Joint Invention in any country to GBT. Such transfer shall take place in a manner to be mutually agreed to by the Parties.

14.2 German Statute on Employee's Inventions

If the German Statute on Employees' Inventions applies, e.g. if a Party or its Affiliate is organized under German Law, each Party agrees to claim the unlimited use of any Invention conceived, reduced to practice, developed, made or created in the performance of, or as a result of, any research by employees of said Party or its Affiliate or any other person acting on its behalf. For the avoidance of doubt, said Party or its Affiliate is responsible for fulfilling the obligations towards their employees under the German Statute of Employee's Inventions.

14.3 Trademarks

GBT shall have the right to determine the trademark(s) for the Products and shall own all trademarks used on or in connection with Products in the Territory, and shall, at its sole cost, be responsible for procurement, maintenance, enforcement and defense of all trademarks used on or in connection with Products in the Territory.

GBT shall not use the Housemark(s) of Roche for any purposes.

14.4 Prosecution of Roche Patent Rights

Roche shall, at its own expense and discretion, Handle all Roche Patent Rights. Roche shall consult with GBT as to the Handling of Roche Patent Rights. Roche agrees to provide GBT with a copy of any proposed patent application, office actions or other material notices and draft responses relating to any Roche Patent Rights for review and comment reasonably in advance of filing (and in no circumstances less than [***] in advance), shall consider GBT's comments in good faith prior to finalizing any draft filing, and shall keep GBT reasonably informed of the status of such filings, prosecution and maintenance of the Roche Patent Rights, including a reasonable time prior to taking or failing to take any action that would affect the scope or validity of any Roche Patent Rights. If Roche's Right of First Negotiation under Article

3 expires with respect to any country, Roche at its own discretion and upon GBT's agreement may assign the Handling of the Roche Patent Rights in such country to GBT, provided however that such Patent Rights shall still be deemed Roche Patent Rights for the purpose of calculating the royalties under this Agreement.

Both Parties shall inform each other on a regular basis on the status of Roche Patent Rights, GBT Patent Rights and Joint Patent Rights, as the case may be.

14.5 Prosecution of GBT Patent Rights and Joint Patent Rights

GBT shall, at its own expense and discretion, Handle all GBT Patent Rights and Joint Patent Rights.

14.6 CREATE Act

It is the intention of the Parties that this Agreement is a "joint research agreement" as that phrase is defined in 35 USC §103(c)(3).

14.7 Patent Coordination Team

Where the Parties need to consult with each other on the Handling of Patent Rights, the Parties shall establish a patent coordination team and shall adopt procedures for interacting on patent matters.

14.8 Unified Patent Court (Europe)

At any time prior to the end of the "transitional period" as such term is used in Article 83 of the Agreement on a Unified Patent Court between the participating Member States of the European Union, for a given relevant EU Roche Patent Right, GBT may request in writing that Roche either (i) opt out from the exclusive competence of the Unified Patent Court or (ii) if applicable, withdraw a previously-registered opt-out, and Roche shall notify the Registry, pay any such registry fee and take such other action as may be necessary to effect the opt-out or opt-out withdrawal.

14.9 Abandonment of Patent Rights

Should GBT decide that it does not desire to Handle a Patent Right that claims an Invention owned by GBT as provided in this Agreement, it shall promptly advise Roche thereof. At the written request of Roche, GBT shall then, at no cost to GBT, assign such Patent Right in such country or countries in the Territory to Roche, and Roche may thereafter Handle the same at Roche's own cost, to the extent that Roche desires to do so.

Should Roche decide that it does not desire to Handle any Patent Right that is licensed to GBT under this Agreement, it shall promptly advise GBT thereof and cease any payments relating to the Handling of such Patent Right after [***] following such advice. At the written request of GBT Roche shall, at no cost to Roche, assign such Patent Right in such country or countries to GBT, and GBT may thereafter Handle the same at GBT's own cost, to the extent that GBT desires to do so.

14.10 Infringement, Patent Enforcement and Defense

Each Party shall promptly provide written notice to the other Party during the Agreement Term of any (i) known infringement or suspected infringement by a Third Party of any Roche Patent Rights, GBT Patent Rights, or Joint Patent Rights, or known or suspected misappropriation by a Third Party of any Roche Know-How, GBT Know-How or Joint Know-How, (ii) submission by a Third Party to a Party or a Regulatory Authority of an application for Regulatory Approval of a product containing a Compound, which submission references a Product, (iii) declaratory judgment action by a Third Party asserting the invalidity, unenforceability or non-infringement of any Roche Patent Rights, GBT Patent Rights or Joint Patent Rights in connection with any

infringement described in clause (i), or (iv) known or suspected unauthorized use or misappropriation by a Third Party of any Roche Know-How, GBT Know-How or Joint Know-How, and shall provide the other Party with all evidence in its possession supporting such infringement or unauthorized use or misappropriation.

Within [***] after GBT provides or receives such written notice ("**Decision Period**"), GBT, in its sole discretion, shall decide whether or not to initiate or defend such suit or action in the Territory and shall notify Roche in writing of its decision in writing ("**Suit Notice**").

If GBT decides to bring or defend a suit or take action, once GBT provides Suit Notice, GBT may immediately commence such suit or take such action. In the event that GBT (i) does not in writing advise Roche within the Decision Period that GBT will commence suit or take action, or (ii) fails to commence suit or take action within a reasonable time after providing Suit Notice, Roche shall thereafter have the right to commence suit or take action in the Territory with respect to the Roche Patent Rights, Roche Know-How or Joint Know-How and shall provide written notice to GBT of any such suit commenced or action taken by Roche. Notwithstanding the above, regarding Roche Patent Rights, GBT's right to bring a suit or take action shall depend upon Roche's prior written approval, which shall not be unreasonably withheld, conditioned or delayed.

Upon written request, the Party bringing suit or taking action ("**Initiating Party**") with respect to the Roche Patent Rights, Roche Know-How or Joint Know-How shall keep the other Party informed of the status of any such suit or action and shall provide the other Party with copies, to the extent the Initiating Party is lawfully permitted to do so, of all substantive documents or communications filed in such suit or action. The Initiating Party shall have the sole and exclusive right to select counsel for any such suit or action.

The Initiating Party shall, except as provided below, pay all expenses of the suit or action, including the Initiating Party's attorneys' fees, court costs and damages owed to Third Parties. Any damages, settlement fees or other consideration received from a Third Party as a result of such suit or action with respect to the alleged infringement or misappropriation of the Roche Patent Rights, Roche Know-How or Joint Know-How shall be allocated as follows:

(a) First, to reimburse the Initiating Party for its costs and, if any remains, to the other Party for any advisory counsel fees and costs; and

(b) Second, the balance, if any, shall be allocated as follows: (i) if Roche is the Initiating Party, [***] percent ([***]%) to Roche and [***] percent ([***]%) to GBT and (ii) if GBT is the Initiating Party, the balance will be deemed [***], and otherwise [***].

If the Initiating Party believes it is reasonably necessary or desirable to obtain an effective remedy, upon written request the other Party agrees to be joined as a party to the suit or action but shall be under no obligation to participate except to the extent that such participation is required by Applicable Law or as the result of its being a named party to the suit or action. At the Initiating Party's written request, the other Party shall offer reasonable assistance to the Initiating Party in connection therewith at no charge to the Initiating Party except for reimbursement of reasonable out-of-pocket expenses incurred by the other Party in rendering such assistance. The other Party shall have the right to participate and be represented in any such suit or action with respect to the Roche Patent Rights, Roche Know-How or Joint Know-How by its own counsel at its own expense.

The Initiating Party may settle, enter into a consent judgment or otherwise voluntarily dispose of the suit or action ("**Settlement**") without the written consent of the other Party but only if such Settlement can be achieved without adversely affecting the other Party (including any of its Patent Rights). If a Settlement could adversely affect the other Party, then the written consent of the other Party would be required, which consent shall not be unreasonably withheld.

For any GBT Patent Rights or Joint Patent Rights, GBT, in its sole discretion, shall decide whether or not to initiate or defend such suit or action in the Territory. GBT shall have full discretion as to how it wishes to handle such suit and may reach Settlement and retain all damages, settlement fees or other consideration under any terms and conditions it desires and retain whatever.

14.11 Defense

If a Third Party asserts that Patent Rights owned by or licensed to it are infringed by the development, manufacture, use, importation, offer for sale or sale of Products, or that its trade secrets were misappropriated in connection with such activity, whether in a direct suit or as a counter claim to any suit brought by a Party as the Initiating Party under Section 14.10, then GBT shall have the exclusive right and responsibility to resolve any such claim, whether by obtaining a license from such Third Party, by defending against such Third Party's claims or otherwise, and shall be solely responsible for the defense of any such action, any and all costs incurred in connection with such action (including, without limitation, attorneys' and expert fees) and all liabilities and damages incurred in connection therewith. Roche shall assist and cooperate with GBT, at GBT's expense, to the extent necessary in the defense of such suit. Notwithstanding the above, GBT shall not enter into any settlement of any such claim without the prior written consent of Roche if such settlement would require Roche to be subject to an injunction or to make any monetary payment to GBT or any Third Party, or admit any wrongful conduct by Roche or its Affiliates, or would limit or restrict the claims of or admit any invalidity and/or unenforceability of any of the Patent Rights Controlled by Roche. Notwithstanding the foregoing, any claim subject to Section 16.1 will be governed by the terms of Sections 16.1 and 16.3 and not this Section 14.11.

14.12 Common Interest Disclosures

With regard to any information or opinions disclosed pursuant to this Agreement by one Party to the other regarding intellectual property and/or technology owned by Third Parties, the Parties agree that they have a common legal interest in determining whether, and to what extent, Third Party intellectual property rights may affect Compound and/or Products, and have a further common legal interest in defending against any actual or prospective Third Party claims based on allegations of misuse or infringement of intellectual property rights relating to the Compound and/or Products. Accordingly, the Parties agree that all such information and materials obtained by GBT and Roche from each other will be used solely for purposes of the Parties' common legal interests with respect to the conduct of the Agreement. All information and materials will be treated as protected by the attorney-client privilege, the work product privilege, and any other privilege or immunity that may otherwise be applicable. By sharing any such information and materials, neither Party intends to waive or limit any privilege or immunity that may apply to the shared information and materials. Neither Party shall have the authority to waive any privilege or immunity on behalf of the other Party without such other Party's prior written consent, nor shall the waiver of privilege or immunity resulting from the conduct of one Party be deemed to apply against any other Party.

The Parties acknowledge that [***].

14.13 Patent Term Extensions

The Parties shall use Commercially Reasonable Efforts to obtain all available patent term extensions, adjustments or restorations, or supplementary protection certificates for Roche Patent Rights and Joint Patent Rights ("**SPCs**", and together with patent term extensions, adjustments and restorations, "**Patent Term Extensions**"). All filings for such Patent Term

Extensions for Patent Rights shall be made [***]. In the event that [***] elects not to file for a Patent Term Extension, [***] shall (a) promptly inform [***] of its intention not to file and (b) grant [***] the right to file for such Patent Term Extension. Each Party shall execute such authorizations and other documents and take such other actions as may be reasonably requested by the other Party to obtain such extensions. The Parties shall cooperate with each other in gaining patent term restorations, extensions and/or SPCs wherever applicable to such Roche Patent Rights. If elections with respect to obtaining Patent Term Extensions are to be made, [***] shall have the sole and exclusive right to make such elections with respect to Roche Patent Rights, Joint Patent Rights and GBT Patent Rights.

15. Representations and Warranties

15.1 Mutual representations and warranties

[***]

15.2 Representations and Warranties by Roche

[***]

15.3 Limitations

Except as provided in Sections 15.1 and 15.2, Roche makes no representation or warranty that all intellectual property rights necessary for GBT to make, have made, use, sell, offer for sale and import the Compound or the Product in the Territory have been granted to GBT under Article 2. Roche did not perform an exhaustive and final search for Third Party Patent Rights or an evaluation thereof for Compound and technologies relevant under this Agreement. Roche will not keep GBT updated about further searches or analyses of Third Party Patent Rights nor will it keep GBT updated about any further developments of any Third Party rights or steps taken or intended to be taken by GBT with regard to such Third Party rights.

15.4 Disclaimer

[***]

16. Indemnification

16.1 Roche indemnification

[***]

16.2 GBT Indemnification

[***]

16.3 Procedure

In the event any GBT Indemnitee or Roche Indemnitee (as the case may be) seeks indemnification under Section 16.1 or 16.2, it shall inform the other Party (the "**Indemnifying Party**") of a claim as soon as reasonably practicable after it receives notice of the claim, shall permit the Indemnifying Party to assume direction and control of the defense of the claim (including the right to settle the claim solely for monetary consideration), and shall cooperate as requested (at the expense of the Indemnifying Party) in the defense of the claim, provided that the Indemnifying Party shall not settle any such claim without the prior written consent of any affected Roche Indemnitee or GBT Indemnitee (as the case may be), if such settlement contains any admission of fault of such GBT Indemnitee or Roche Indemnitee (as the case may be).

17. Liability

17.1 Disclaimer

[***]

17.2 Limitation of Liability

IN NO EVENT SHALL EITHER PARTY BE LIABLE FOR SPECIAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES INCLUDING LOST REVENUES OR PROFITS, IRRESPECTIVE OF THE LEGAL BASIS FOR SUCH CLAIMS. THIS LIMITATION OF LIABILITY SHALL NOT APPLY IN THE EVENT OF DAMAGES CAUSED BY GROSS NEGLIGENCE OR WILLFUL MISCONDUCT OF THE DAMAGING PARTY.

18. Obligation Not to Disclose Confidential Information

18.1 Non-Use and Non-Disclosure

During the Agreement Term and for [***] thereafter, the Receiving Party shall (i) treat Confidential Information provided by Disclosing Party in confidence, at least as it would treat its own information of a similar nature, (ii) not disclose such Confidential Information to Third Parties, without the Disclosing Party's prior written consent, and (iii) not use such Confidential Information other than for fulfilling its obligations or exercising its rights under this Agreement. Each Party may disclose the other Party's Confidential Information only to those of its and its Affiliates' employees, agents and contractors who require such information for the purpose in the preceding clause (iii) and who are under written obligations of non-disclosure and non-use at least as stringent as those herein.

18.2 Permitted Disclosure

Notwithstanding the obligation of non-use and non-disclosure set forth in Section 18.1, the Parties recognize the need for certain exceptions to this obligation, specifically set forth below, with respect to press releases, Patent Rights, publications, and certain commercial considerations. Once any information has been publicly disclosed by a Party in a press release or other public disclosure in accordance with this Article 18, such Party shall have the right to publicly disclose the same information without following the review procedures of this Article 18.

18.3 Press Releases

GBT may issue a press release announcing the existence and selected material terms of this Agreement, upon prior approval by Roche, in a form substantially similar to the template attached as Appendix 18.3.

Each Party shall provide the other Party with a copy of any draft press release related to the activities contemplated by this Agreement or the terms of this Agreement at least two (2) weeks prior to its intended publication for the other Party's review. The other Party may provide suggested modification to the draft press release. Each Party shall consider the other Party's suggestions prior to issuing its press release.

Notwithstanding the foregoing, in the event of a press release required by Applicable Law, including regulations applicable to the public sale of securities, each Party shall provide the other Party with such advance notice as it reasonably can, and nothing in this Agreement will restrict such Party's issuance of such press release.

18.4 Publications

During the Agreement Term, the following restrictions shall apply with respect to disclosure by any Party of Confidential Information relating to the Compound and Products in any publication or presentation:

GBT shall provide Roche with a copy of any proposed publication or presentation at least [***] days (or at least [***] days in the case of oral presentations) prior to submission for publication so as to provide Roche with an opportunity to recommend any changes it reasonably believes are necessary to continue to maintain the Confidential Information disclosed by Roche to GBT in accordance with the requirements of this Agreement. The incorporation of such recommended changes shall not be unreasonably refused; and if Roche notifies ("**Publishing Notice**") GBT in writing, within [***] days after receipt of the copy of the proposed publication or presentation (or at least [***] days in the case of oral presentations), that such publication or presentation in its reasonable judgment (i) contains an invention, solely or jointly conceived and/or reduced to practice and owned by Roche, for which Roche reasonably desires to obtain patent protection or (ii) could be expected to have a material adverse effect on the commercial value of any Confidential Information disclosed by Roche to GBT, then GBT shall prevent such publication or delay such publication for a mutually agreeable period of time. In the case of inventions, a delay shall be for a period reasonably sufficient to permit the timely preparation and filing of a patent application(s) on such invention, and in no event less than [***] days from the date of the Publishing Notice.

Roche shall not issue any publication or make any presentation related to any Compound or Product in the Field without the prior written consent of GBT, which GBT may grant or withhold in its sole discretion.

18.5 Commercial Considerations

Nothing in this Agreement shall prevent GBT or its Affiliates from disclosing Confidential Information of Roche to (i) governmental agencies to the extent required or desirable to secure government approval for the development, manufacture or sale of Products in the Territory, (ii) Third Parties acting on behalf of GBT, to the extent reasonably necessary for the development, manufacture or sale of Products in the Territory, (iii) Third Parties to the extent reasonably necessary to market any Product in the Territory, (iv) Third Parties to the extent reasonably necessary in connection with a prospective or actual Partner Agreement, (v) Third Parties to the extent reasonably necessary to otherwise carry out its obligations or exercise its rights under this Agreement, (vi) Third Parties in connection with a prospective or actual financing, investment in or Change of Control of GBT, provided that any such disclosures are subject to confidentiality obligations at least as onerous as those set forth in this Agreement.

The Receiving Party may disclose Confidential Information of the Disclosing Party (including the terms and conditions of this Agreement) to the extent that such Confidential Information is required to be disclosed by the Receiving Party to comply with Applicable Law, to defend or prosecute litigation or to comply with governmental regulations or applicable regulations of a stock exchange, provided that the Receiving Party provides prior written notice of such disclosure to the Disclosing Party and, to the extent practicable, takes reasonable and lawful actions to minimize the degree of such disclosure and to ensure such disclosed Confidential Information is treated confidentially.

19. Exclusivity Following Change of Control or Assignment

If (a) following a Change of Control of GBT, GBT or any other member of the Change of Control Group, or (b) following an assignment by GBT of its rights under this Agreement to any Third Party other than Roche or its Affiliates (an "**Assignee**"), such Assignee, in either case of (a) or (b) has a Competing Product, then GBT, such other member of the Change of Control Group or such Assignee (as applicable) shall be required to notify Roche thereof and shall use [***] to out-license such Competing Product to a Third Party other than to [***] or [***]. In case GBT, such other member of the Change of Control Group or the Assignee (as applicable) fails to out-license the Competing Product within [***] after the notification to Roche, Roche shall have the right to terminate this Agreement upon written notice, but with immediate effect as of the date of such written notice.

20. Term and Termination

20.1 Commencement and Term

This Agreement shall commence on the Effective Date and continue for the Agreement Term.

20.2 Termination

20.2.1 Termination for Breach

A Party ("**Non-Breaching Party**") shall have the right to terminate this Agreement in its entirety in the event the other Party ("**Breaching Party**") is in breach of any of its material obligations under this Agreement. The non-Breaching Party shall provide written notice to the Breaching Party, which notice shall identify the breach. The Breaching Party shall have a period of [***] after such written notice is provided ("**Peremptory Notice Period**") to cure such breach. If the Breaching Party has a *bona fide* dispute as to whether such breach occurred or has been cured, it will so notify the Non-Breaching Party, and the expiration of the Peremptory Notice Period shall be tolled until such dispute is resolved pursuant to Sections 22.2-22.5. Upon a determination pursuant to Section 22.5 of material breach or failure to cure, the Breaching Party may have the remainder of the Peremptory Notice Period to cure such breach. If such breach is not cured within the Peremptory Notice Period, then the Non-Breaching Party shall either withdraw its request for termination or within [***] after the expiration of the Peremptory Notice Period terminate this Agreement with immediate effect by sending a written notice of termination to the Breaching Party.

20.2.2 Termination for Insolvency Event

In the event one Party ("**Insolvency Party**") incurs an Insolvency Event, the other Party ("**Non-Insolvency Party**") shall have the right to terminate this Agreement in its entirety effective immediately upon written notice to the Insolvency Party of such termination.

20.2.3 Termination by GBT without a Cause

GBT shall have the right to terminate this Agreement at any time in its entirety or on a Product-by-Product basis upon six (6) months' prior written notice to Roche delivered before First Commercial Sale of the Product or upon nine (9) months' prior written notice to Roche delivered after the First Commercial Sale of the Product. The effective date of termination under this Section 20.2.3 shall be the date six (6) months (or nine (9) months as the case may be) after GBT provides such written notice to Roche.

20.3 Consequences of Termination

20.3.1 Termination by GBT for Breach by Roche or Roche Insolvency

Upon termination by GBT under Section 20.2.1 or 22.2.2 for breach by Roche or Roche incurring an Insolvency Event, the rights and licenses granted by Roche to GBT under this Agreement shall terminate in their entirety on the effective date of termination.

20.3.2 Termination by GBT without Cause, Termination by Roche for Breach by GBT, GBT Insolvency or GBT Debarment

Upon any termination by GBT under Section 20.2.3 without cause, termination by Roche under Section 20.2.1 for breach by GBT, termination by Roche under Section 20.2.2 for GBT incurring an Insolvency Event or termination by Roche under Section 22.8 for GBT debarment, the rights and licenses granted by Roche to GBT under this Agreement shall terminate in their entirety, or on a Product-by Product basis, as applicable, in any case on the effective date of termination.

If this Agreement is to be terminated in its entirety under this Section 20.3.2 and Roche has an interest to continue development and/or commercialization of Product(s), Roche shall notify GBT in writing of such interest within [***] of receipt of GBT's notice of termination under Section 20.2.3 or simultaneously with Roche's notice of breach by GBT under Section 20.2.1 or Roche's termination notice under Section 20.2.2 or 22.8, as the case may be. If GBT receives such notification, GBT shall provide Roche as soon as practicable thereafter with the data in the Data Room related to the Compound(s) and/or Product(s) for which this Agreement is to be terminated and Roche shall following the receipt of access to the Data Room have [***] to provide GBT with a notice describing (i) Roche's intention to continue ongoing development and commercialization of Terminated Product(s) and (ii) Roche's request for GBT's continuation of activities (during the termination notice period prior to the effective date of termination) and/or transfer of the data, material and information relating to the Product(s) as provided below (the "**Continuation Election Notice**"). Following GBT's timely receipt of such Continuation Election Notice and to the extent reasonably requested by Roche, the following will apply solely with respect to the Compound(s) and Product(s) for which this Agreement is terminated:

a) Unless the termination was by GBT under Section 20.2.3 for safety reasons, GBT shall, to the extent GBT has the right to do so, transfer to Roche all regulatory filings and approvals, all final pre-clinical, non-clinical and clinical study reports and clinical study protocols, trademarks, and all data, including clinical data, materials and information, in GBT's possession and control related to the terminated Compound(s) or Product(s) and necessary or useful for Roche to continue to develop and commercialize the Product(s).

b) Unless the termination was by GBT under Section 20.2.3 for safety reasons, GBT shall [***] related to the terminated Compound(s) or Product(s) [***];

c) Roche shall, upon such transfers under clauses (a) and (b), have the right to disclose such filings, approvals and data to (i) governmental agencies to the extent required or desirable to secure government approval for the development, manufacture or sale of Product(s); (ii) Third Parties acting on behalf of Roche or its Affiliates for the development, manufacture, or sale of Product(s), or (iii) Third Parties to the extent reasonably necessary to market Product(s).

d) If the effective date of termination is [***] (in case of a termination of this Agreement on a Product-by-Product basis) or for any Terminated Product (in case of a termination of this Agreement in its entirety), Roche shall have a fully paid up, royalty-free, worldwide, non-exclusive, sublicensable, transferable, license under the GBT Patent Rights, GBT Know-How and GBT's interest in the Joint Patent Rights to allow Roche, its Affiliates or licensees to research, develop, manufacture, have manufactured, use, offer to sell, sell, promote, export and import the Terminated Products.

e) If the effective date of termination is [***] (in case of a termination of this Agreement on a Product-by-Product basis) or for any Terminated Product (in case of a termination of this Agreement in its entirety) but [***] (in case of a termination of this Agreement on a Product-by-Product basis) or any such Terminated Product (in case of a termination of this Agreement in its entirety), Roche shall have a worldwide, non-exclusive, sublicensable, transferable, royalty-bearing license under the GBT Patent Rights, GBT Know-How and GBT's interest in the Joint Patent Rights to allow Roche, its Affiliates or licensees to research, develop, manufacture, have manufactured, use, offer to sell, sell, promote, export and import the terminated Compound and Terminated Products. Roche shall pay to GBT a royalty of [***] percent ([***]%) of Net Sales by Roche or its Affiliate or licensee for [***] after the First Commercial Sale of such Terminated Products on a country-by-country basis. Articles 11, 12 and 13 and applicable definitions in Article 1 will apply to such royalty payments and royalty payments under this Section 20.3.2(e) *mutatis mutandis*.

f) If the effective date of termination is [***] (in case of a termination of this Agreement on a Product-by-Product basis) or any Terminated Product (in case of a termination of this Agreement in its entirety), Roche shall have a worldwide, non-exclusive, sublicensable, transferable, royalty-bearing license under the GBT Patent Rights, GBT Know-How and GBT's interest in the Joint Patent Rights to allow Roche, its Affiliates or licensees to research, develop, manufacture, have manufactured, use, offer to sell, sell, promote, export and import the terminated Compound and Terminated Products. Roche shall pay to GBT a royalty of [***] percent ([***]%) of Net Sales for [***] after the First Commercial Sale of the Terminated Product on a country-by-country basis, for example if the Terminated Product is transferred to Roche after [***] following the First Commercial Sale of the Terminated Product in the US, then Roche shall pay to GBT a royalty for the remaining [***]. Articles 11, 12 and 13 and applicable definitions in Article 1 will apply to such royalty payments and royalty payments under this Section 20.3.2(f) *mutatis mutandis*.

20.3.3 Obligations Related to Ongoing Activities

20.3.3.1 Without Timely Continuation Election Notice

If Roche does not provide a timely Continuation Election Notice as provided in Section 20.3.2, then GBT (a) shall have the right to cancel all cancellable ongoing obligations and (b) shall complete all non-cancellable obligations at its own expense.

20.3.3.2 With Timely Continuation Election Notice

If Roche provides a timely Continuation Election Notice, then from the date of the notice of termination until the effective date of termination, GBT shall continue activities ongoing as of the date of the notice of termination at its own expense.

After the effective date of termination, GBT shall not have any obligation to perform and/or complete any activities or to make any payments for performing or completing any activities under this Agreement, except as expressly stated herein.

Notwithstanding the foregoing, in case of termination by Roche under Sections 20.2.1, 20.2.2, or 22.8 or by GBT under Section 20.2.3 (other than for safety reasons), upon the request of Roche, GBT shall, with respect to all clinical trials ongoing as of the date of the notice of such termination [***] Under (ii) above, the Parties shall discuss in good faith timing and sharing of clinical trial costs related to the clinical trial either completed by GBT or transferred by GBT to Roche.

20.3.4 Obligations Related to Manufacturing

In the case of termination by Roche according to Sections 20.2.1, 20.2.2 or 22.8 or by GBT under Section 20.2.3 (other than for safety reasons), if Roche provides a timely Continuation Election Notice as provided in Section 20.3.2, then GBT shall [***]; and (iii) use Commercially Reasonable Efforts to [***].

20.3.5 Ancillary Agreements

Unless otherwise agreed by the Parties, the termination of this Agreement shall cause the automatic termination of all ancillary agreements related hereto, if any.

20.3.6 Royalty and Payment Obligations

Termination of this Agreement by a Party, for any reason, shall not release GBT from any obligation to pay royalties or make any other payments to Roche that are due and payable or accrued prior to the effective date of termination, and shall not affect any other rights or obligations of either Party that have accrued prior to the effective date of termination.

20.3.7 Effects of a Change of Control

If there is a Change of Control, then the Party experiencing such Change of Control ("**Acquired Party**") shall provide written notice to the other Party ("**Non-Acquired Party**") at least [***] prior to completion of such Change of Control, subject to any confidentiality obligations of the Acquired Party then in effect (but in any event shall notify the Non-Acquired Party within [***] after completion of such Change of Control).

20.3.8 Survival

Articles 12 (Taxes), 13 (Auditing), 16 (Indemnification), Article 17 (Liability), Article 18 (Obligation Not to Disclose Confidential Information), Article 20 (Term and Termination) and Sections 11.2 (Late Payment), 14.1 (Ownership of Inventions), 14.2 (German Statute on Employee's Inventions), 15.4 (Disclaimer), 22.1 (Entire Agreement; Governing Law), 22.2 (Disputes), 22.3-22.5 (Arbitration), 21.7 (Assignment) and 22.15 (Notices) shall survive any expiration or termination of this Agreement for any reason.

21. Bankruptcy

All licenses (and to the extent applicable rights) granted under or pursuant to this Agreement by Roche to GBT are, and shall otherwise be deemed to be, for purposes of Section 365(n) of Title 11, US Code (the "**Bankruptcy Code**") licenses of rights to "intellectual property" as defined under Section 101(60) of the Bankruptcy Code. Unless GBT elects to terminate this Agreement, the Parties agree that GBT, as a licensee or sublicensee of such rights under this Agreement, shall retain and may fully exercise all of its rights and elections under the Bankruptcy Code, subject to the continued performance of its obligations under this Agreement.

22. Miscellaneous

22.1 Entire Agreement; Governing Law

This Agreement is the entire agreement between the Parties with respect to the subject matter herein, and supersedes any and all prior agreements, understandings, negotiations or correspondence between the Parties respecting the subject matter hereof, whether written or verbal (including, without limitation, the MTA and that certain Non-Disclosure Agreement,

dated October 23, 2017, between GBT and Roche US (the "**NDA**"), which are hereby terminated in their entirety. This Agreement shall be governed by and construed in accordance with the laws of New York, without reference to its conflict of laws principles, and shall not be governed by the United Nations Convention of International Contracts on the Sale of Goods (the Vienna Convention) ("**Governing Law**").

22.2 Disputes

Unless otherwise set forth in this Agreement, in the event of any dispute in connection with this Agreement, such dispute shall be, by written notice ("**Escalation Notice**") referred to the respective executive officers of the Parties designated below or their designees, for good faith negotiations attempting to resolve the dispute. The designated executive officers are as follows:

For GBT: CEO
For Roche: Head of Roche Partnering

22.3 Arbitration
[***]

22.4 Arbitrators
[***]

22.5 Decisions; Timing of Decisions
[***]

22.6 Insurance

GBT shall purchase and maintain throughout the Agreement Term insurance or indemnity protection that is co-equal with its indemnity obligations. This shall include, but not be limited to broad form commercial general liability insurance (including product liability). The limit of liability for such coverage shall be no less than [***] US Dollars (US$[***]) per claim/occurrence in the aggregate. GBT shall also maintain workers' compensation insurance. GBT shall provide Roche with written evidence of such insurances after the Effective Date and thereafter on [***] basis.

22.7 Assignment

Subject to the terms and conditions of this Agreement and except where otherwise provided, neither Party may assign its rights or obligations under this Agreement absent the prior written consent of the other Party, except that each Party may assign this Agreement without such consent to any of its Affiliates or in the context of a merger, acquisition, sale or other transaction involving all or substantially all of the assets of the Party seeking to assign, in which case such Party in its sole discretion may assign its rights and obligations under this Agreement. Any permitted assignment shall be binding on the successors of the assigning Party.

22.8 Debarment

GBT represents and warrants that it has never been debarred under 21 U.S.C. §335a, disqualified under 21 C.F.R. §312.70 or §812.119, sanctioned by a Federal Health Care Program (as defined in 42 U.S.C. §1320 a-7b(f)), including without limitation the federal Medicare or a state Medicaid program, or debarred, suspended, excluded or otherwise declared ineligible from any other similar Federal or state agency or program. In the event GBT receives notice of debarment, suspension, sanction, exclusion, ineligibility or disqualification under the above-referenced statutes, GBT shall immediately notify Roche in writing and Roche shall have the right, but not the obligation, to terminate this Agreement, effective, at Roche's option, immediately or at a specified future date, with the consequences set forth in Section 20.3.2.

22.9 Independent Contractor

No employee or representative of either Party shall have any authority to bind or obligate the other Party to this Agreement for any sum or in any manner whatsoever or to create or impose any contractual or other liability on the other Party without said Party's prior written approval. For all purposes, and notwithstanding any other provision of this Agreement to the contrary, GBT's legal relationship to Roche under this Agreement shall be that of independent contractor.

22.10 Unenforceable Provisions and Severability

If any of the provisions of this Agreement are held to be void or unenforceable, then such void or unenforceable provisions shall be replaced by valid and enforceable provisions that will achieve as far as possible the economic business intentions of the Parties. However the remainder of this Agreement will remain in full force and effect, provided that the material interests of the Parties are not affected, i.e. the Parties would presumably have concluded this Agreement without the unenforceable provisions.

22.11 Waiver

The failure by either Party to require strict performance and/or observance of any obligation, term, provision or condition under this Agreement will neither constitute a waiver thereof nor affect in any way the right of the respective Party to require such performance and/or observance. The waiver by either Party of a breach of any obligation, term, provision or condition hereunder shall not constitute a waiver of any subsequent breach thereof or of any other obligation, term, provision or condition.

22.12 Appendices

All Appendices to this Agreement shall form an integral part to this Agreement.

22.13 Amendments

No amendments of the terms and conditions of this Agreement shall be binding upon either Party hereto unless in writing and signed by both Parties.

22.14 Invoices

All invoices that are required or permitted hereunder shall be in writing and sent by Roche to GBT at the following address or other address as GBT may later provide:

[***]

22.15 Notice

All notices that are required or permitted hereunder shall be in writing and sufficient if delivered personally, sent by facsimile (and promptly confirmed by personal delivery, registered or certified mail or overnight courier), sent by nationally recognized overnight courier or sent by registered or certified mail, postage prepaid, return receipt requested, addressed as follows:

if to GBT, to:	Global Blood Therapeutics, Inc. 171 Oyster Point Blvd., Ste. 300 South San Francisco, CA 94080 Attn: Chief Legal Officer

with a copy to:	Cooley LLP 3175 Hanover St. Palo Alto, CA 94304 Attn: Barbara A. Kosacz
if to Roche, to:	F. Hoffmann-La Roche Ltd Grenzacherstrasse 124 4070 Basel Switzerland Attn: Legal Department Facsimile No.: +41 61 688 13 96
and:	Hoffmann-La Roche Inc. 150 Clove Road, Suite 8 Little Falls New Jersey 07424, U.S.A. Attn. Corporate Secretary Facsimile No.: +1 973 890 8433

or to such other address as the Party to whom notice is to be given may have furnished to the other Party in writing in accordance herewith.

[Signature Page Follows]

* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

IN WITNESS WHEREOF, the Parties have entered into this Agreement as of the Effective Date.

Global Blood Therapeutics, Inc.

/s/ Ted W. Love
Name: Ted W. Love, M.D.
Title: CEO

F. Hoffmann-La Roche Ltd

/s/ Joerg Kazenwadel
Name: Dr. Joerg Kazenwadel
Title: Head of R&D Out-Partnering

/s/ Franziska Bächler
Name: Dr. Franziska Bächler
Title: Legal Counsel

Hoffmann-La Roche Inc.

/s/ John P. Parise
Name: John P. Parise
Title: Authorized Signatory

* Confidential Information, indicated by [***], has been omitted from this filing and filed separately with the Securities and Exchange Commission

Appendix 1.14

Compound

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Appendix 1.54 A)

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Appendix 1.54 B)

Roche Know-How

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Appendix 1.55 (a)

Roche Patent Rights

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Appendix 1.55 (b)

Excluded Patent Rights

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Appendix 2.3

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Appendix 6.2

Development Plan

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Appendix 10.7

Third Party Payments

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Appendix 18.3

Press Release

GBT Expands Sickle Cell Disease Pipeline with Worldwide Licensing Agreement for Inclacumab for the Treatment of Vaso-occlusive Crisis

SOUTH SAN FRANCISCO, Calif. – August [***] 2018 - Global Blood Therapeutics, Inc. (GBT) (NASDAQ: GBT) announced today that it has entered into an exclusive worldwide licensing agreement with F. Hoffman-La Roche Ltd. for the development and commercialization of inclacumab, a novel fully human monoclonal antibody against P-selectin. GBT plans to develop inclacumab as a treatment for vaso-occlusive crises (VOC) in patients with sickle cell disease (SCD).

Under the terms of the agreement, GBT will be responsible for all development, manufacturing, and commercialization of inclacumab worldwide. Roche will receive an upfront payment of $2.0 million from GBT and is eligible to receive up to approximately $125 million in development and commercialization milestone payments for the sickle cell disease indication. Additionally, Roche is eligible to receive tiered royalties based on net revenues for inclacumab.

“We have been working diligently to diversify our product pipeline through both internal research and external business development efforts and are excited to have entered into this agreement for inclacumab,” said Ted Love, M.D., president and chief executive officer of GBT. “We are committed to developing transformative treatments for the SCD community and becoming the preeminent SCD company. Inclacumab is an ideal complement to voxelotor, our lead investigational oral, once-daily therapy, in Phase 3 clinical development for SCD. Like voxelotor, inclacumab has a strong scientific rationale and has the potential to provide significant clinical benefit for SCD patients.”

Roche was previously developing inclacumab for patients with coronary artery disease. The pharmacokinetic, safety, and tolerability profile of inclacumab are well characterized based upon Roche’s prior clinical studies, which enrolled more than 500 patients. Roche discontinued the inclacumab program following Phase 2 clinical trials.

P-selectin inhibition is a clinically validated target in SCD, known to reduce the incidence of VOCs. GBT plans to develop inclacumab for this indication and intends to leverage the safety data produced from Roche’s prior clinical studies as we proceed with our development in SCD. GBT has already begun the process of technology transfer from Roche to a contract manufacturing organization, and anticipates submitting an Investigational New Drug application to the U.S. Food and Drug Administration for inclacumab in 2021.

About Inclacumab

Inclacumab is a novel, fully human monoclonal antibody designed to bind to and selectively inhibit P-selectin, an adhesion molecule found on endothelial cells and platelets that contributes to the cell-cell interactions that are involved in the pathogenesis of VOC.

About Sickle Cell Disease

SCD is a lifelong inherited blood disorder caused by a genetic mutation in the beta-chain of hemoglobin, which leads to the formation of abnormal hemoglobin known as sickle hemoglobin (HbS). In its

deoxygenated state, HbS has a propensity to polymerize, or bind together, forming long, rigid rods within a red blood cell (RBC). The polymer rods deform RBCs to assume a sickled shape and to become inflexible, which causes hemolytic anemia (the destruction of RBCs) that can eventually lead to multi-organ damage and early death. This sickling process also causes blockage in capillaries and small blood vessels, and adhesion molecules, such as P-selectin play an important role in this process. Beginning in childhood, SCD patients suffer unpredictable and recurrent episodes or crises of severe pain due to blocked blood flow to organs, which often lead to psychosocial and physical disabilities.

About Vaso-Occlusive Crisis

Vaso-occlusive crisis (VOC) is the most common clinical manifestation of SCD. It occurs when the microcirculation is obstructed by sickled RBCs, causing ischemic injury to the organ supplied and resultant pain. Approximately half of individuals with SCD experience VOC. Pain crises begin suddenly and may last several hours to several days. The pain can affect any body part but often involves the abdomen, bones, joints and soft tissue.[1] VOC result in a decrease in quality of life[2] and an increase in the risk of death.[3]

About GBT

GBT is a clinical-stage biopharmaceutical company determined to discover, develop and deliver innovative treatments that provide hope to underserved patient communities. GBT is developing its lead product candidate, voxelotor, as an oral, once-daily therapy for sickle cell disease. To learn more, please visit www.gbt.com and follow the company on Twitter @GBT_news.

GBT Forward-Looking Statements

Statements we make in this press release may include statements that are not historical facts and are considered forward-looking within the meaning of Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended. We intend these forward-looking statements, including statements regarding the therapeutic potential and safety profile of inclacumab, the therapeutic potential and safety profile of voxelotor, our plans to develop inclacumab as a treatment for VOCs in patients with SCD and leverage the safety data from Roche's prior clinical studies, the potential upfront, milestone and royalty payments, our commitment to developing transformative treatments for the SCD community and becoming the preeminent SCD company, our belief that inclacumab is an ideal complement to voxelotor, our anticipated submission of an IND to the FDA for inclacumab in 2021, our ability to implement and complete our clinical development plans for voxelotor and inclacumab, our ability to generate and report data from our ongoing and potential future studies of voxelotor and inclacumab, regulatory review and actions relating to voxelotor and inclacumab, and the timing of these events, to be covered by the safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act and Section 21E of the Securities Exchange Act and are making this statement for purposes of complying with those safe harbor provisions. These forward-looking statements reflect our current views about our plans, intentions, expectations, strategies and prospects, which are based on the information currently available to us and on assumptions we have made. We can give no assurance that the plans, intentions, expectations or strategies will be attained or achieved, and furthermore, actual results may differ materially from those described in the forward-looking statements and will be affected by a variety of risks and factors that are beyond our control including, without limitation, the risks that our clinical and preclinical development activities may be delayed or terminated for a variety of reasons, that results of clinical trials may be subject to differing interpretations, that regulatory authorities may disagree with our clinical development plans or require additional studies or data to support further clinical investigation of our product candidates, that drug-

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1 https://emedicine.medscape.com/article/205926-clinical. Accessed June 5, 2018.

2 van Tuijn CF, van Beers EJ, Schnog JJ, Biemond BJ. Pain rate and social circumstances rather than cumulative organ damage determine the quality of life in adults with sickle cell disease. *Am J Hematol.* 2010;85:532-535

3 Platt OS, Brambilla DJ, Rosse WF, et al. Mortality in sickle cell disease — life expectancy and risk factors for early death. *N Engl J Med* .1994;330:1639-1644.

related adverse events may be observed in clinical development, and that data and results may not meet regulatory requirements or otherwise be sufficient for further development, regulatory review or approval, along with those risks set forth in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2018, as well as discussions of potential risks, uncertainties and other important factors in our subsequent filings with the U.S. Securities and Exchange Commission. Except as required by law, we assume no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

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GBT
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Julie Normart (media)
W2O pure for GBT
415-946-1087
media@gbt.com

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Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO RULES 13a-14(a) AND 15d-14(a) OF THE SECURITIES EXCHANGE ACT, AS ADOPTED
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Ted W. Love, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Global Blood Therapeutics, Inc.;

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

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

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

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

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

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

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

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

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

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

Date: November 6, 2018

/s/ Ted W. Love, M.D.

Ted W. Love, M.D.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO RULES 13a-14(a) AND 15d-14(a) OF THE SECURITIES EXCHANGE ACT, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Jeffrey Farrow, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Global Blood Therapeutics, Inc.;

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

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

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

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

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

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

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

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

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

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

Date: November 6, 2018

/s/ Jeffrey Farrow

Jeffrey Farrow
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

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

In connection with the Quarterly Report of Global Blood Therapeutics, Inc. (the "Company") on Form 10-Q for the quarter ended September 30, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Ted W. Love, President and Chief Executive Officer of the Company, and Jeffrey Farrow, Chief Financial Officer, do each hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, 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/ Ted W. Love, M.D.
Ted W. Love, M.D.
President and Chief Executive Officer
(Principal Executive Officer)

November 6, 2018

/s/ Jeffrey Farrow
Jeffrey Farrow
Chief Financial Officer
(Principal Financial Officer)

November 6, 2018

This certification accompanies the 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 Global Blood Therapeutics, Inc. 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.