

**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 June 30, 2019

or

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

For the transition period from: _____ to _____

Commission File Number 000-21937

CERUS CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

1220 Concord Avenue, Suite 600
Concord, California
(Address of principal executive offices)

68-0262011
(I.R.S. Employer
Identification No.)

94520
(Zip Code)

(925) 288-6000

(Registrant's telephone number, including area code)

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

<u>Title of Each Class</u>	<u>Trading Symbol</u>	<u>Name of Each Exchange on Which Registered</u>
Common Stock, par value \$0.001 per share	CERS	The Nasdaq Stock Market LLC

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

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

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

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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

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

As of July 22, 2019, there were 140,321,542 shares of the registrant's common stock outstanding.

CERUS CORPORATION
FORM 10-Q
For the Quarterly Period Ended June 30, 2019

TABLE OF CONTENTS

PART I FINANCIAL INFORMATION

Item 1.	Financial Statements	1
	Unaudited Condensed Consolidated Balance Sheets – June 30, 2019 and December 31, 2018	1
	Unaudited Condensed Consolidated Statements of Operations – Three and six months ended June 30, 2019 and 2018	2
	Unaudited Condensed Consolidated Statements of Comprehensive Loss – Three and six months ended June 30, 2019 and 2018	3
	Unaudited Condensed Consolidated Statements of Stockholders’ Equity – Three and six months ended June 30, 2019 and 2018	4
	Unaudited Condensed Consolidated Statements of Cash Flows – Six months ended June 30, 2019 and 2018	5
	Notes to Unaudited Condensed Consolidated Financial Statements	6
Item 2.	Management’s Discussion and Analysis of Financial Condition and Results of Operations	21
Item 3.	Quantitative and Qualitative Disclosures About Market Risk	31
Item 4.	Controls and Procedures	31

PART II OTHER INFORMATION

Item 1.	Legal Proceedings	32
Item 1A.	Risk Factors	32
Item 2.	Unregistered Sales of Equity Securities and Use of Proceeds	68
Item 3.	Defaults Upon Senior Securities	68
Item 4.	Mine Safety Disclosures	68
Item 5.	Other Information	68
Item 6.	Exhibits	69

SIGNATURES	70
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PART I: FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

CERUS CORPORATION
CONDENSED CONSOLIDATED BALANCE SHEETS
(in thousands)

	June 30, 2019 (Unaudited)	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 23,543	\$ 28,859
Short-term investments	72,659	88,718
Accounts receivable	13,432	8,752
Inventories	17,447	13,539
Prepaid and other current assets	8,756	7,034
Total current assets	<u>135,837</u>	<u>146,902</u>
Non-current assets:		
Property and equipment, net	15,345	8,130
Goodwill	1,316	1,316
Operating lease right-of-use assets	14,417	—
Intangible assets, net	233	334
Restricted cash	2,677	2,728
Other assets	4,802	4,050
Total assets	<u>\$ 174,627</u>	<u>\$ 163,460</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 21,058	\$ 18,595
Accrued liabilities	16,654	19,800
Manufacturing and development obligations	6,198	5,928
Debt – revolving loan	4,496	—
Debt – term loan	—	7,857
Operating lease liabilities – current	1,711	—
Deferred product revenue – current	665	498
Total current liabilities	<u>50,782</u>	<u>52,678</u>
Non-current liabilities:		
Debt – non-current	39,327	22,013
Operating lease liabilities – non-current	18,722	—
Other non-current liabilities	164	4,250
Total liabilities	<u>108,995</u>	<u>78,941</u>
Commitments and contingencies		
Stockholders' equity:		
Common stock	140	136
Additional paid-in capital	880,622	863,531
Accumulated other comprehensive income (loss)	91	(281)
Accumulated deficit	(815,221)	(778,867)
Total stockholders' equity	<u>65,632</u>	<u>84,519</u>
Total liabilities and stockholders' equity	<u>\$ 174,627</u>	<u>\$ 163,460</u>

See accompanying Notes to Unaudited Condensed Consolidated Financial Statements.

CERUS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
UNAUDITED
(in thousands, except per share data)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Product revenue	\$ 18,209	\$ 15,420	\$ 35,713	\$ 28,984
Cost of product revenue	8,111	7,720	16,543	15,050
Gross profit on product revenue	10,098	7,700	19,170	13,934
Government contract revenue	4,266	4,047	8,727	7,502
Operating expenses:				
Research and development	14,417	9,881	27,857	19,318
Selling, general and administrative	16,740	14,437	32,901	28,044
Total operating expenses	31,157	24,318	60,758	47,362
Loss from operations	(16,793)	(12,571)	(32,861)	(25,926)
Non-operating expense, net:				
Foreign exchange gain (loss)	105	(138)	(57)	(30)
Interest expense	(1,150)	(958)	(4,074)	(1,873)
Other income, net	337	444	759	775
Total non-operating expense, net	(708)	(652)	(3,372)	(1,128)
Loss before income taxes	(17,501)	(13,223)	(36,233)	(27,054)
Provision for income taxes	61	59	121	113
Net loss	<u>\$ (17,562)</u>	<u>\$ (13,282)</u>	<u>\$ (36,354)</u>	<u>\$ (27,167)</u>
Net loss per share:				
Basic and diluted	\$ (0.13)	\$ (0.10)	\$ (0.26)	\$ (0.21)
Weighted average shares used for calculating net loss per share:				
Basic and diluted	138,281	131,352	137,698	128,101

See accompanying Notes to Unaudited Condensed Consolidated Financial Statements.

CERUS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
UNAUDITED
(in thousands)

	<u>Three Months Ended</u> <u>June 30,</u>		<u>Six Months Ended</u> <u>June 30,</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Net loss	\$ (17,562)	\$ (13,282)	\$ (36,354)	\$ (27,167)
Other comprehensive income (loss)				
Unrealized gains (losses) on available-for-sale investments, net of taxes	161	9	372	(320)
Comprehensive loss	<u>\$ (17,401)</u>	<u>\$ (13,273)</u>	<u>\$ (35,982)</u>	<u>\$ (27,487)</u>

See accompanying Notes to Unaudited Condensed Consolidated Financial Statements.

CERUS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
UNAUDITED
(in thousands)

	Three Months Ended June 30, 2019						Three Months Ended June 30, 2018					
	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount					Shares	Amount				
Balances at beginning of period	137,818	138	867,091	(70)	(797,659)	69,500	130,545	131	821,081	(426)	(735,188)	\$ 85,598
Net loss	—	—	—	—	(17,562)	(17,562)	—	—	—	—	(13,282)	(13,282)
Other comprehensive income	—	—	—	161	—	161	—	—	—	9	—	9
Issuance of common stock from public offering, net of offering costs	1,978	2	9,834	—	—	9,836	1,780	2	11,908	—	—	11,910
Issuance of common stock from exercise of stock options, vesting of restricted stock units, and ESPP purchases	265	—	558	—	—	558	1,137	—	3,616	—	—	3,616
Stock-based compensation	—	—	3,139	—	—	3,139	—	—	2,593	—	—	2,593
Balances at end of period	<u>140,061</u>	<u>\$ 140</u>	<u>\$ 880,622</u>	<u>\$ 91</u>	<u>\$ (815,221)</u>	<u>\$ 65,632</u>	<u>133,462</u>	<u>\$ 133</u>	<u>\$ 839,198</u>	<u>\$ (417)</u>	<u>\$ (748,470)</u>	<u>\$ 90,444</u>

	Six Months Ended June 30, 2019						Six Months Ended June 30, 2018					
	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount					Shares	Amount				
Balances at beginning of period	136,853	136	863,531	(281)	(778,867)	84,519	115,555	115	760,225	(97)	(721,303)	38,940
Net loss	—	—	—	—	(36,354)	(36,354)	—	—	—	—	(27,167)	(27,167)
Other comprehensive income (loss)	—	—	—	372	—	372	—	—	—	(320)	—	(320)
Issuance of common stock from public offering, net of offering costs	1,978	2	9,834	—	—	9,836	15,819	17	69,155	—	—	69,172
Issuance of common stock from exercise of stock options, vesting of restricted stock units, and ESPP purchases	1,230	2	1,240	—	—	1,242	2,088	1	4,910	—	—	4,911
Stock-based compensation	—	—	6,017	—	—	6,017	—	—	4,908	—	—	4,908
Balances at end of period	<u>140,061</u>	<u>\$ 140</u>	<u>\$ 880,622</u>	<u>\$ 91</u>	<u>\$ (815,221)</u>	<u>\$ 65,632</u>	<u>133,462</u>	<u>\$ 133</u>	<u>\$ 839,198</u>	<u>\$ (417)</u>	<u>\$ (748,470)</u>	<u>\$ 90,444</u>

See accompanying Notes to Unaudited Condensed Consolidated Financial Statements.

CERUS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
UNAUDITED
(in thousands)

	Six Months Ended	
	June 30,	
	2019	2018
Operating activities		
Net loss	\$ (36,354)	\$ (27,167)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	1,908	788
Stock-based compensation	6,017	4,908
Non-cash interest expense	247	537
Loss on disposal of property and equipment	14	5
Changes in operating assets and liabilities:		
Accounts receivable	(4,680)	1,027
Inventories	(3,977)	1,458
Other assets	1,817	(1,587)
Accounts payable	3,229	154
Accrued liabilities and other non-current liabilities	(3,410)	554
Manufacturing and development obligations	(38)	(148)
Deferred product revenue	167	216
Net cash used in operating activities	<u>(35,060)</u>	<u>(19,255)</u>
Investing activities		
Capital expenditures	(6,516)	(145)
Purchases of investments	(27,728)	(75,462)
Proceeds from maturities and sale of investments	43,000	24,002
Net cash provided by (used in) investing activities	<u>8,756</u>	<u>(51,605)</u>
Financing activities		
Net proceeds from equity incentives	1,270	4,912
Net proceeds from public offering	6,783	69,117
Net proceeds from revolving line of credit	4,496	—
Proceeds from loans	39,433	—
Repayment of debt	(31,045)	(65)
Net cash provided by financing activities	<u>20,937</u>	<u>73,964</u>
Net (decrease) increase in cash, cash equivalents and restricted cash	(5,367)	3,104
Cash, cash equivalents and restricted cash, beginning of period	31,587	13,930
Cash, cash equivalents and restricted cash, end of period	<u>\$ 26,220</u>	<u>\$ 17,034</u>

See accompanying Notes to Unaudited Condensed Consolidated Financial Statements.

CERUS CORPORATION
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
UNAUDITED

Note 1. Summary of Significant Accounting Policies

Principles of Consolidation and Basis of Presentation

The accompanying unaudited condensed consolidated financial statements include those of Cerus Corporation and its subsidiary, Cerus Europe B.V. (together with Cerus Corporation, hereinafter “Cerus” or the “Company”) after elimination of all intercompany accounts and transactions. These unaudited condensed consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America, or U.S. (“GAAP”) for interim financial information and pursuant to the rules and regulations of the Securities and Exchange Commission (“SEC”). Accordingly, they do not include all of the information and footnotes required by GAAP for complete financial statements. In the opinion of management, all adjustments, consisting of normal recurring entries, considered necessary for a fair presentation have been made. Operating results for the three and six months ended June 30, 2019, are not necessarily indicative of the results that may be expected for the year ending December 31, 2019, or for any future periods.

These unaudited condensed consolidated financial statements and notes thereto should be read in conjunction with the Company’s audited consolidated financial statements and notes thereto for the year ended December 31, 2018, which were included in the Company’s 2018 Annual Report on Form 10-K, filed with the SEC on February 27, 2019. The accompanying condensed consolidated balance sheet as of December 31, 2018, has been derived from the Company’s audited consolidated financial statements as of that date.

Use of Estimates

The preparation of financial statements requires management to make estimates, assumptions and judgments that affect the reported amounts of assets, liabilities, revenue and expenses, and related disclosures of contingent assets and liabilities. On an ongoing basis, management evaluates its estimates, including those related to the nature and timing of satisfaction of performance obligations, the timing when the customer obtains control of products or services, the standalone selling price (“SSP”) of performance obligations, variable consideration, accounts receivable, inventory reserves, fair values of investments, stock-based compensation, intangible assets and goodwill, useful lives of intangible assets and property and equipment, income taxes, accrued liabilities, and incremental borrowing rate, among others. The Company bases its estimates on historical experience, future projections, and on various other assumptions that are believed to be reasonable under the circumstances. Actual results may differ from those estimates under different assumptions or conditions.

Revenue

Revenue is recognized in accordance with that core principle by applying the following five steps: (1) identify the contract(s) with a customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when (or as) the entity satisfies a performance obligation.

The Company’s main source of revenue is product revenue from sales of the INTERCEPT Blood System for platelets and plasma (“platelet and plasma systems” or “disposable kits”), UVA illumination devices (“illuminators”), spare parts and storage solutions, and maintenance services of illuminators. The Company sells its platelet and plasma systems directly to blood banks, hospitals, universities, government agencies, as well as to distributors in certain regions. The Company uses a binding purchase order or signed sales contract as evidence of a contract and satisfaction of its policy. Generally, the Company’s contracts with its customers do not provide for open return rights, except within a reasonable time after receipt of goods in the case of defective or non-conforming product. The contracts with customers can include various combinations of products, and to a lesser extent, services. The Company must determine whether products or services are capable of being distinct and accounted for as separate performance obligations, or are accounted for as a combined performance obligation. The Company must allocate the transaction price to each performance obligation on a relative SSP basis, and recognize the product revenue when the performance obligation is satisfied. The Company determines the SSP by using the historical selling price of the products and services. If the amount of consideration in a contract is variable, the Company estimates the amount of variable consideration that should be included in the transaction price using the most likely amount method, to the extent it is probable that a significant future reversal of cumulative product revenue under the contract will not occur. Product revenue is recognized upon transfer of control of promised products or services to customers in an amount that reflects the consideration to which the Company expects to receive in exchange for those products or services. Product revenue from the sale of illuminators, disposable kits, spare parts and storage solutions are recognized upon the transfer of control of the products to the customer. Product revenue from maintenance services are recognized ratably on a straight-line basis over the term of maintenance as customers simultaneously consume and receive benefits. Freight costs charged to customers are recorded as a component of product revenue. Taxes that the Company invoices to its customers and remits to governments are recorded on a net basis, which excludes such tax from product revenue.

The Company receives reimbursement under its U.S. government contract with the Biomedical Advanced Research and Development Authority (“BARDA”) that supports research and development of defined projects. See “Note 10. Development and License Agreements—Agreement with BARDA”. The contract generally provides for reimbursement of approved costs incurred under the terms of the contract. Revenue related to the cost reimbursement provisions under the Company’s U.S. government contract are recognized as the qualified direct and indirect costs on the projects are incurred. The Company invoices under its U.S. government contract using the provisional rates in the government contract and thus is subject to future audits at the discretion of government. These audits could result in an adjustment to government contract revenue previously reported, which adjustments potentially could be significant. The Company believes that revenue for periods not yet audited has been recorded in amounts that are expected to be realized upon final audit and settlement. Costs incurred related to services performed under the contract are included as a component of research and development or selling, general and administrative expenses in the Company’s condensed consolidated statements of operations. The Company’s use of estimates in recording accrued liabilities for government contract activities (see “Use of Estimates” above) affects the revenue recorded from development funding and under the government contract.

Disaggregation of Product Revenue

Product revenue by geographical locations of customers during the three and six months ended June 30, 2019 and 2018, were as follows (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Product revenue:				
Europe, Middle East and Africa	\$ 12,748	\$ 12,018	\$ 25,400	\$ 23,024
North America	5,158	3,149	9,709	5,536
Other	303	253	604	424
Total product revenue	\$ 18,209	\$ 15,420	\$ 35,713	\$ 28,984

Contract Balances

The Company invoices its customers based upon the terms in the contracts, which is generally from 30 to 60 days. Accounts receivable are recorded when the Company’s right to the consideration are estimated to be unconditional. The Company had no contract assets at June 30, 2019 and December 31, 2018.

Contract liabilities mainly consist of deferred product revenue related to maintenance services, unshipped products, and uninstalled illuminators. Maintenance services are generally billed upfront at the beginning of each annual service period and recognized ratably over the service period. The increase in the deferred product revenue balance for the six months ended June 30, 2019 is primarily driven by performance obligations not satisfied but invoiced as of June 30, 2019, offset by \$0.4 million of revenue recognized that were included in the deferred product revenue balance as of December 31, 2018.

The Company applies an optional exemption to not disclose the value of unsatisfied performance obligations for contracts that have an original expected duration of one year or less.

Research and Development Expenses

Research and development (“R&D”) expenses are charged to expense when incurred, including cost incurred pursuant to the terms of the Company’s U.S. government contract. Research and development expenses include salaries and related expenses for scientific and regulatory personnel, payments to consultants, supplies and chemicals used in in-house laboratories, costs of R&D facilities, depreciation of equipment and external contract research expenses, including clinical trials, preclinical safety studies, other laboratory studies, process development and product manufacturing for research use.

The Company’s use of estimates in recording accrued liabilities for R&D activities (see “Use of Estimates” above) affects the amounts of R&D expenses recorded from development funding and under its U.S. government contract. Actual results may differ from those estimates under different assumptions or conditions.

Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less from the date of purchase to be classified as cash equivalents. These investments primarily consist of money market instruments, and are classified as available-for-sale.

Investments

Investments with original maturities of greater than three months primarily include corporate debt and U.S. government agency securities that are designated as available-for-sale and classified as short-term investments. Available-for-sale securities are carried at estimated fair value. The Company views its available-for-sale portfolio as available for use in its current operations. Unrealized gains and losses derived by changes in the estimated fair value of available-for-sale securities were recorded in "Unrealized gains (losses) on available-for-sale investments, net of taxes" on the Company's unaudited condensed consolidated statements of comprehensive loss. Realized gains (losses) from the sale of available-for-sale investments, if any, were recorded in "Other income, net" on the Company's unaudited condensed consolidated statements of operations. The costs of securities sold are based on the specific identification method, if applicable. The Company reported the amortization of any premium and accretion of any discount resulting from the purchase of debt securities as a component of interest income.

The Company also reviews its available-for-sale securities on a regular basis to evaluate whether any security has experienced an other-than-temporary decline in fair value. Other-than-temporary declines in market value, if any, are recorded in "Other income, net" on the Company's unaudited condensed consolidated statements of operations.

Restricted Cash

As of June 30, 2019, the Company's "Restricted cash" primarily consisted of a letter of credit relating to the lease of the Company's new office building. As of June 30, 2019 and December 31, 2018, the Company also had certain non-U.S. dollar denominated deposits recorded as "Restrict cash" in compliance with certain foreign contractual requirements.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash equivalents, available-for-sale securities and accounts receivable.

Pursuant to the Company's investment policy, substantially all of the Company's cash, cash equivalents and available-for-sale securities are maintained at major financial institutions of high credit standing. The Company monitors the financial credit worthiness of the issuers of its investments and limits the concentration in individual securities and types of investments that exist within its investment portfolio. Generally, all of the Company's investments carry high credit quality ratings, which is in accordance with its investment policy. At June 30, 2019, the Company does not believe there is significant financial risk from non-performance by the issuers of the Company's cash equivalents and short-term investments.

Concentrations of credit risk with respect to trade receivables exist. On a regular basis, including at the time of sale, the Company performs credit evaluations of its significant customers that it expects to sell to on credit terms. Generally, the Company does not require collateral from its customers to secure accounts receivable. To the extent that the Company determines specific invoices or customer accounts may be uncollectible, the Company establishes an allowance for doubtful accounts against the accounts receivable on its unaudited condensed consolidated balance sheets and records a charge on its unaudited condensed consolidated statements of operations as a component of selling, general and administrative expenses.

The Company had three and two customers that accounted for more than 10% of the Company's outstanding trade receivables at June 30, 2019 and December 31, 2018, respectively. These customers cumulatively represented approximately 58% and 50% of the Company's outstanding trade receivables at June 30, 2019 and December 31, 2018, respectively. To date, the Company has not experienced collection difficulties from these customers.

Inventories

At June 30, 2019 and December 31, 2018, inventory consisted of work-in-process and finished goods only. Finished goods include INTERCEPT disposable kits, illuminators, and certain replacement parts for the illuminators. Platelet and plasma systems' disposable kits generally have 18 to 24 months shelf lives from the date of manufacture. Illuminators and replacement parts do not have regulated expiration dates. Work-in-process includes certain components that are manufactured over a protracted length of time before being sold to, and ultimately incorporated and assembled by Fresenius Kabi Deutschland GmbH or Fresenius, Inc. (with their affiliates, "Fresenius") into the finished INTERCEPT disposable kits. The Company maintains an inventory balance based on its current sales projections, and at each reporting period, the Company evaluates whether its work-in-process inventory would be sold to Fresenius for production of finished units in order to sell to existing and prospective customers within the next twelve-month period. It is not

customary for the Company's production cycle for inventory to exceed twelve months. Instead, the Company uses its best judgment to factor in lead times for the production of its work-in-process and finished units to meet the Company's forecasted demands. If actual results differ from those estimates, work-in-process inventory could potentially accumulate for periods exceeding one year. At June 30, 2019 and December 31, 2018, the Company classified its work-in-process inventory as a current asset on its condensed consolidated balance sheets based on its evaluation that the work-in-process inventory would be sold to Fresenius for finished disposable kit production within each respective subsequent twelve-month period.

Inventory is recorded at the lower of cost, determined on a first-in, first-out basis, or net realizable value. The Company uses significant judgment to analyze and determine if the composition of its inventory is obsolete, slow-moving or unsalable and frequently reviews such determinations. The Company writes down specifically identified unusable, obsolete, slow-moving, or known unsalable inventory that has no alternative use in the period that it is first recognized by using a number of factors including product expiration dates, open and unfulfilled orders, and sales forecasts. Any write-down of its inventory to net realizable value establishes a new cost basis and will be maintained even if certain circumstances suggest that the inventory is recoverable in subsequent periods. Costs associated with the write-down of inventory are recorded in "Cost of product revenue" on the Company's condensed consolidated statements of operations. At June 30, 2019 and December 31, 2018, the Company had \$0.3 million recorded for potential obsolete, expiring or unsalable product.

Property and Equipment, net

Property and equipment is comprised of furniture, equipment, leasehold improvements, construction-in-progress, information technology hardware and software and is recorded at cost. At the time the property and equipment is ready for its intended use, it is depreciated on a straight-line basis over the estimated useful lives of the assets (generally three to five years). Leasehold improvements are amortized on a straight-line basis over the shorter of the lease term or the estimated useful lives of the improvements. During the six months ended June 30, 2019 and 2018, the Company had non-cash purchases of capital expenditures of \$2.9 million and \$0.4 million, respectively.

Goodwill and Intangible Assets, net

Intangible assets, net, which include a license for the right to commercialize the INTERCEPT Blood System in Asia, are subject to ratable amortization over the original estimated useful life of ten years. Accumulated amortization of intangible assets as of June 30, 2019 and December 31, 2018, was \$1.8 million and \$1.7 million, respectively. Goodwill is not amortized but instead is subject to an impairment test performed on an annual basis, or more frequently if events or changes in circumstances indicate that goodwill may be impaired. Such impairment analysis is performed on August 31 of each fiscal year, or more frequently if indicators of impairment exist. The test for goodwill impairment may be assessed using qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than the carrying amount. If the Company determines that it is more likely than not that the fair value of a reporting unit is less than the carrying amount, the Company must then proceed with performing the quantitative goodwill impairment test. The Company may choose not to perform the qualitative assessment to test goodwill for impairment and proceed directly to the quantitative impairment test; however, the Company may revert to the qualitative assessment to test goodwill for impairment in any subsequent period. The quantitative goodwill impairment test compares the fair value of each reporting unit with its respective carrying amount, including goodwill. The Company has determined that it operates in one reporting unit and estimates the fair value of its one reporting unit using the enterprise approach under which it considers the quoted market capitalization of the Company as reported on the Nasdaq Global Market. The Company considers quoted market prices that are available in active markets to be the best evidence of fair value. The Company also considers other factors, which include future forecasted results, the economic environment and overall market conditions. If the fair value of the reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired. If the carrying amount of the reporting unit's goodwill exceeds the implied fair value of that goodwill, an impairment loss is recognized in an amount equal to that excess, limited to the carrying amount of goodwill in the Company's one reporting unit.

The Company performs an impairment test on its intangible assets if certain events or changes in circumstances occur which indicate that the carrying amounts of its intangible assets may not be recoverable. If the intangible assets are not recoverable, an impairment loss would be recognized by the Company based on the excess amount of the carrying value of the intangible assets over its fair value. During the three and six months ended June 30, 2019 and 2018, there were no impairment charges recognized related to the acquired intangible assets.

Long-lived Assets

The Company evaluates its long-lived assets for impairment by continually monitoring events and changes in circumstances that could indicate carrying amounts of its long-lived assets may not be recoverable. When such events or changes in circumstances occur, the Company assesses recoverability by determining whether the carrying value of such assets will be recovered through the undiscounted expected future cash flows. If the expected undiscounted future cash flows are less than the carrying amount of these assets, the Company then measures the amount of the impairment loss based on the excess of the carrying amount over the fair value of the assets.

Foreign Currency Remeasurement

The functional currency of the Company's foreign subsidiary is the U.S. dollar. Monetary assets and liabilities denominated in foreign currencies are remeasured in U.S. dollars using the exchange rates at the balance sheet date. Non-monetary assets and liabilities denominated in foreign currencies are remeasured in U.S. dollars using historical exchange rates. Product revenues and expenses are remeasured using average exchange rates prevailing during the period. Remeasurements are recorded in the Company's condensed consolidated statements of operations.

Stock-Based Compensation

Stock-based compensation expense is measured at the grant-date based on the fair value of the award and is recognized as expense on a straight-line basis over the requisite service period, which is the vesting period, and is adjusted for estimated forfeitures. To the extent that stock options contain performance criteria for vesting, stock-based compensation is recognized once the performance criteria are probable of being achieved.

For stock-based awards issued to non-employees, the measurement date at which the fair value of the stock-based award is measured to be the earlier of (i) the date at which a commitment for performance by the grantee to earn the equity instrument is reached or (ii) the date at which the grantee's performance is complete. The Company recognizes stock-based compensation expense for the fair value of the vested portion of the non-employee stock-based awards in its condensed consolidated statements of operations.

See Note 8 for further information regarding the Company's stock-based compensation expense.

Income Taxes

The provision for income taxes is accounted for using an asset and liability approach, under which deferred tax assets and liabilities are determined based on differences between the financial reporting and tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The Company does not recognize tax positions that do not have a greater than 50% likelihood of being recognized upon review by a taxing authority having full knowledge of all relevant information. Use of a valuation allowance is not an appropriate substitute for derecognition of a tax position. The Company recognizes accrued interest and penalties related to unrecognized tax benefits in its income tax expense. To date, the Company has not recognized any interest and penalties in its unaudited condensed consolidated statements of operations, nor has it accrued for or made payments for interest and penalties. Although the Company believes it more likely than not that a taxing authority would agree with its current tax positions, there can be no assurance that the tax positions the Company has taken will be substantiated by a taxing authority if reviewed. The Company's U.S. federal tax returns for years 1998 through 2017, California tax returns for years through 2017, and Netherlands tax returns for years 2015 through 2017 remain subject to examination by the taxing jurisdictions due to unutilized net operating losses and research credits. The Company continues to carry a valuation allowance on substantially all of its net deferred tax assets.

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. Diluted net loss per share gives effect to all potentially dilutive common shares outstanding for the period. The potentially dilutive securities include stock options, employee stock purchase plan rights and restricted stock units, which are calculated using the treasury stock method. For the three and six months ended June 30, 2019 and 2018, all potentially dilutive securities outstanding have been excluded from the computation of dilutive weighted average shares outstanding because such securities have an antidilutive impact due to losses reported.

The table below presents potential shares that were excluded from the calculation of the weighted average number of shares outstanding used for the calculation of diluted net loss per share. These are excluded from the calculation due to their anti-dilutive effect for the three and six months ended June 30, 2019 and 2018 (shares in thousands):

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2019	2018	2019	2018
Weighted average number of anti-dilutive potential shares:				
Stock options	17,691	18,631	17,670	18,259
Restricted stock units	2,897	2,024	2,578	1,803
Employee stock purchase plan rights	—	171	—	157
Total	<u>20,588</u>	<u>20,826</u>	<u>20,248</u>	<u>20,219</u>

Leases

The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use (“ROU”) assets and operating lease liabilities in the Company’s condensed consolidated balance sheets. As of June 30, 2019 and December 31, 2018, the Company did not have finance leases.

ROU assets and operating lease liabilities are recognized at commencement date based on the present value of lease payments over the lease term. The Company uses its incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments. The ROU asset also includes any lease payments made and excludes lease incentives. The lease terms may include options to extend or terminate the lease when it is reasonably certain to be exercised. Operating leases are recognized on a straight-line basis over the lease term.

Guarantee and Indemnification Arrangements

The Company recognizes the fair value for guarantee and indemnification arrangements issued or modified by the Company. In addition, the Company monitors the conditions that are subject to the guarantees and indemnifications in order to identify if a loss has occurred. If the Company determines it is probable that a loss has occurred, then any such estimable loss would be recognized under those guarantees and indemnifications. Some of the agreements that the Company is a party to contain provisions that indemnify the counter party from damages and costs resulting from claims that the Company’s technology infringes the intellectual property rights of a third-party or claims that the sale or use of the Company’s products have caused personal injury or other damage or loss. The Company has not received any such requests for indemnification under these provisions and has not been required to make material payments pursuant to these provisions.

The Company generally provides for a one-year warranty on certain of its INTERCEPT blood-safety products covering defects in materials and workmanship. The Company accrues costs associated with warranty obligations when claims become known and are estimable. The Company has not experienced significant or systemic warranty claims nor is it aware of any existing current warranty claims. Accordingly, the Company had not accrued for any future warranty costs for its products at June 30, 2019 and December 31, 2018.

Fair Value of Financial Instruments

The Company applies the provisions of fair value relating to its financial assets and liabilities. The carrying amounts of accounts receivables, accounts payable, and other accrued liabilities approximate their fair value due to the relative short-term maturities. Based on the borrowing rates currently available to the Company for loans with similar terms, the Company believes the fair value of its debt approximates their carrying amounts. The Company measures and records certain financial assets and liabilities at fair value on a recurring basis, including its available-for-sale securities. The Company classifies instruments within Level 1 if quoted prices are available in active markets for identical assets, which include the Company’s cash accounts and money market funds. The Company classifies instruments in Level 2 if the instruments are valued using observable inputs to quoted market prices, benchmark yields, reported trades, broker/dealer quotes or alternative pricing sources with reasonable levels of price transparency. These instruments include the Company’s corporate debt and U.S. government agency securities holdings. The available-for-sale securities are held by a custodian who obtains investment prices from a third-party pricing provider that uses standard inputs (observable in the market) to models which vary by asset class. The Company classifies instruments in Level 3 if one or more significant inputs or significant value drivers are unobservable. The Company assesses any transfers among fair value measurement levels at the end of each reporting period.

See Note 2 for further information regarding the Company’s valuation of financial instruments.

New Accounting Pronouncements

Recently adopted accounting pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases*, which, for operating leases, requires a lessee to recognize a right-of-use asset and a lease liability, initially measured at the present value of the lease payments, in its condensed consolidated balance sheet. The standard also requires a lessee to recognize a single lease cost, calculated so that the cost of the lease is allocated over the lease term, on a generally straight-line basis. In July 2018, the FASB issued ASU No. 2018-11, *Leases (Topic 842): Targeted Improvements*, which provides for certain practical expedient when implementing the new leases standard. The Company adopted the new accounting standard on January 1, 2019, using the modified retrospective method and elected the package of practical expedients for expired or existing contracts, which allowed the Company not to reassess (1) whether contracts are or contain leases, (2) lease classification and (3) initial direct costs. The Company recorded right-of-use assets of \$2.4 million in “Operating lease right-of-use assets” in the Company’s condensed consolidated balance sheets, and lease liabilities of \$2.4 million in aggregate in “Operating lease liabilities – current” and “Operating lease liabilities – non-current” in the Company’s condensed consolidated balance sheets on the adoption date. The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods.

Recently issued accounting pronouncements not yet adopted

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, which requires measurement and recognition of expected credit losses for financial assets held. The standard is effective for annual periods beginning after December 15, 2019, and interim periods thereafter, with early application permitted. The Company plans to adopt this ASU on January 1, 2020, using the modified retrospective transition method. The Company is currently assessing the future impact of this ASU on the Company's condensed consolidated financial statements.

Note 2. Available-for-sale Securities and Fair Value on Financial Instruments*Available-for-sale Securities*

The following is a summary of available-for-sale securities at June 30, 2019 (in thousands):

	June 30, 2019			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
United States government agency securities	\$ 11,028	\$ 5	\$ (3)	\$ 11,030
Corporate debt securities	61,540	103	(14)	61,629
Total available-for-sale securities	<u>\$ 72,568</u>	<u>\$ 108</u>	<u>\$ (17)</u>	<u>\$ 72,659</u>

The following is a summary of available-for-sale securities at December 31, 2018 (in thousands):

	December 31, 2018			
	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
Money market funds	\$ 6,167	\$ —	\$ —	\$ 6,167
United States government agency securities	15,971	—	(23)	15,948
Corporate debt securities	73,028	2	(260)	72,770
Total available-for-sale securities	<u>\$ 95,166</u>	<u>\$ 2</u>	<u>\$ (283)</u>	<u>\$ 94,885</u>

Available-for-sale securities at June 30, 2019 and December 31, 2018, consisted of the following by contractual maturity (in thousands):

	June 30, 2019		December 31, 2018	
	Amortized Cost	Fair Value	Amortized Cost	Fair Value
One year or less	\$ 49,997	\$ 50,034	\$ 85,227	\$ 84,957
Greater than one year and less than five years	22,571	22,625	9,939	9,928
Total available-for-sale securities	<u>\$ 72,568</u>	<u>\$ 72,659</u>	<u>\$ 95,166</u>	<u>\$ 94,885</u>

The following tables show all available-for-sale marketable securities in an unrealized loss position for which an other-than-temporary impairment has not been recognized and the related gross unrealized losses and fair value, aggregated by investment category and length of time that individual securities have been in a continuous unrealized loss position (in thousands):

	June 30, 2019					
	Less than 12 Months		12 Months or Greater		Total	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
United States government agency securities	\$ 5,527	\$ (2)	\$ 3,496	\$ (1)	\$ 9,023	\$ (3)
Corporate debt securities	4,050	(5)	22,003	(9)	26,053	(14)
Total available-for-sale securities	\$ 9,577	\$ (7)	\$ 25,499	\$ (10)	\$ 35,076	\$ (17)

	December 31, 2018					
	Less than 12 Months		12 Months or Greater		Total	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
United States government agency securities	\$ 14,948	\$ (22)	\$ 999	\$ (1)	\$ 15,947	\$ (23)
Corporate debt securities	60,813	(231)	9,976	(29)	70,789	(260)
Total available-for-sale securities	\$ 75,761	\$ (253)	\$ 10,975	\$ (30)	\$ 86,736	\$ (283)

As of June 30, 2019, the Company considered the declines in market value of its marketable securities investment portfolio to be temporary in nature and did not consider any of its investments other-than-temporarily impaired. The Company typically invests in highly-rated securities, and its investment policy limits the amount of credit exposure to any one issuer. The policy generally requires investments to be investment grade, with the primary objective of minimizing the potential risk of principal loss. Fair values were determined for each individual security in the investment portfolio. When evaluating an investment for other-than-temporary impairment, the Company reviews factors such as the length of time and extent to which fair value has been below its cost basis, the financial condition of the issuer and any changes thereto, changes in market interest rates, and the Company's intent to sell, or whether it is more likely than not it will be required to sell the investment before recovery of the investment's cost basis. During the three and six months ended June 30, 2019 and 2018, the Company did not recognize any other-than-temporary impairment loss. The Company has no current requirement or intent to sell the securities in an unrealized loss position. The Company expects to recover up to (or beyond) the initial cost of investment for securities held. The Company did not record any gross realized gains or losses from the sale or maturity of available-for-sale investments during the three and six months ended June 30, 2019 and 2018.

Fair Value Disclosures

The Company uses certain assumptions that market participants would use to determine the fair value of an asset or liability in pricing the asset or liability in an orderly transaction between market participants at the measurement date. The identification of market participant assumptions provides a basis for determining what inputs are to be used for pricing each asset or liability. A fair value hierarchy has been established which gives precedence to fair value measurements calculated using observable inputs over those using unobservable inputs. This hierarchy prioritized the inputs into three broad levels as follows:

- Level 1: Quoted prices in active markets for identical instruments
- Level 2: Other significant observable inputs (including quoted prices in active markets for similar instruments)
- Level 3: Significant unobservable inputs (including assumptions in determining the fair value of certain investments)

Money market funds are highly liquid investments and are actively traded. The pricing information on these investment instruments are readily available and can be independently validated as of the measurement date. This approach results in the classification of these securities as Level 1 of the fair value hierarchy.

To estimate the fair value of Level 2 debt securities as of June 30, 2019, the Company's primary pricing service relies on inputs from multiple industry-recognized pricing sources to determine the price for each investment. Corporate debt and U.S. government agency securities are systematically priced by this service as of the close of business each business day. If the primary pricing service does not price a specific asset a secondary pricing service is utilized.

The fair values of the Company's financial assets and liabilities were determined using the following inputs at June 30, 2019 (in thousands):

	Balance sheet classification	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
United States government agency securities	Short-term investments	\$ 11,030	\$ —	\$ 11,030	\$ —
Corporate debt securities	Short-term investments	61,629	—	61,629	—
Total financial assets		\$ 72,659	\$ —	\$ 72,659	\$ —

The fair values of the Company's financial assets and liabilities were determined using the following inputs at December 31, 2018 (in thousands):

	Balance sheet classification	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market funds	Cash and cash equivalents	\$ 6,167	\$ 6,167	\$ —	\$ —
United States government agency securities	Short-term investments	15,948	—	15,948	—
Corporate debt securities	Short-term investments	72,770	—	72,770	—
Total financial assets		\$ 94,885	\$ 6,167	\$ 88,718	\$ —

The Company did not have any transfers among fair value measurement levels during the three and six months ended June 30, 2019.

Note 3. Inventories

Inventories at June 30, 2019 and December 31, 2018, consisted of the following (in thousands):

	June 30, 2019	December 31, 2018
Work-in-process	\$ 4,633	\$ 3,075
Finished goods	12,814	10,464
Total inventories	\$ 17,447	\$ 13,539

Note 4. Accrued Liabilities

Accrued liabilities at June 30, 2019 and December 31, 2018, consisted of the following (in thousands):

	June 30, 2019	December 31, 2018
Accrued compensation and related costs	\$ 8,073	\$ 10,765
Accrued professional services	4,652	4,544
Other accrued expenses	3,929	4,491
Total accrued liabilities	\$ 16,654	\$ 19,800

Note 5. Debt

Debt at June 30, 2019, consisted of the following (in thousands):

	June 30, 2019		
	Principal	Unamortized Discount	Total
Term Loan Credit Agreement	\$ 40,000	\$ (673)	\$ 39,327
Less: debt – current	—	—	—
Debt – non-current	\$ 40,000	\$ (673)	\$ 39,327

Debt at December 31, 2018, consisted of the following (in thousands):

	December 31, 2018		
	Principal	Unamortized Discount	Net Carrying Value
Oxford Term Loan Agreement	\$ 30,000	\$ (130)	\$ 29,870
Less: debt – current	(7,857)	—	(7,857)
Debt – non-current	\$ 22,143	\$ (130)	\$ 22,013

Principal, interest and fee payments on Term Loan Credit Agreement at June 30, 2019, are expected to be as follows (in thousands):

Year ended December 31,	Principal	Interest and Fees	Total
2019	\$ —	\$ 1,648	\$ 1,648
2020	—	3,294	3,294
2021	—	3,285	3,285
2022	15,000	2,873	17,873
2023	20,000	1,300	21,300
2024	5,000	1,269	6,269
Total	\$ 40,000	\$ 13,669	\$ 53,669

Loan Agreements

Prior to March 29, 2019, the Company maintained a loan and security agreement (the “Oxford Term Loan Agreement”) with Oxford Finance LLC (“Oxford”). The Oxford Term Loan Agreement provided for secured growth capital term loans of up to \$40.0 million. The Oxford Term Loan Agreement was available in two tranches. The first tranche of \$30.0 million (“2017 Term Loan A”) was drawn by the Company on July 31, 2017, with the proceeds used in part to repay in full all of the outstanding term loans under the previous Term Loan Agreement of \$17.6 million and the final payment of the previous Term Loan Agreement of \$1.4 million. The availability of the second tranche of \$10.0 million (“2017 Term Loan B”) expired on May 14, 2018, and the Company did not elect to draw the 2017 Term Loan B.

On March 29, 2019 (the “Closing Date”), the Company entered into a Credit, Security and Guaranty Agreement (Term Loan) (the “Term Loan Credit Agreement”) with MidCap Financial Trust (“MidCap”) to borrow up to \$70 million in three tranches (collectively “2019 Term Loan”), with a maturity date of March 1, 2024. The first advance of \$40.0 million (“Tranche 1”) was drawn by the Company on March 29, 2019, with the proceeds used in part to repay in full the outstanding term loans and fees under the Oxford Term Loan Agreement. The Company repaid principal and interest in an aggregate amount equal to approximately \$31.2 million and prepayment fees in an aggregate amount equal to approximately \$0.6 million, and terminated all obligations under the Oxford Term Loan Agreement. As a result, the Company recorded a loss of \$2.1 million on the extinguishment of Oxford term loans in “Interest expense” on the Company’s condensed consolidated statements of operations. The second advance of \$15.0 million (“Tranche 2”) will be available to the Company from January 1, 2020 through December 31, 2020, subject to the Company’s satisfaction of certain conditions described in the Term Loan Credit Agreement, and (ii) the third advance of \$15.0 million (“Tranche 3”) will be available to the Company starting April 1, 2020, through March 31, 2021, subject to the Company’s satisfaction of certain other conditions described in the Term Loan Credit Agreement. The borrowings under the 2019 Term Loan bears interest at the sum of a fixed percentage spread and the greater of (i) 1.8% or (ii) one month LIBOR. The effective interest rate on the Term Loan at June 30, 2019 was approximately 8.10%. All three tranches require interest only payments through April 1, 2022, followed by 24 months of payments with interest and equal payment of principal. The interest only payment period can be extended for 12 months upon achievement of a specified trailing twelve month net revenue target. Prepayments of the 2019 Term Loan under the Term Loan Credit Agreement, in whole or in part, will be subject to early termination fees which decline each year until the fourth anniversary, at which time there is no early termination fee. Upon the final payment, the Company must also pay an exit fee calculated based on a percentage of the aggregate principal amount of all tranches advanced to the Company.

The Company also entered into a Credit, Security and Guaranty Agreement (Revolving Loan) (the “Revolving Loan Credit Agreement”) with MidCap on March 29, 2019, to initially borrow up to \$5.0 million. The amount borrowed under the Revolving Loan Credit Agreement can be increased, upon request by the Company by up to an additional \$15.0 million, subject to agent and lender approval and the satisfaction of certain conditions. The Revolving Loan Credit Agreement has a maturity date of March 1, 2024. Amounts drawn under the Revolving Loan Credit Agreement bear interest at the sum of a fixed percentage spread and the greater of (i) 1.80% or (ii) one month LIBOR. There are also fractional fees based on the amounts either drawn or undrawn. If the Revolving Loan Credit Agreement is terminated before maturity or the funding obligation is permanently reduced, there are declining fees for the entirety of its term. As of June 30, 2019, the Company had borrowed \$4.5 million under the Revolving Loan Credit Agreement, which is included in “Debt – revolving loan” in the Company’s condensed consolidated balance sheets.

The Term Loan Credit Agreement and Revolving Loan Credit Agreement contain certain non-financial covenants, with which the Company was in compliance at June 30, 2019. Additionally, both agreements are secured by most of the Company’s assets, excluding intellectual property.

Note 6. Commitments and Contingencies

Operating Leases

The Company leases its office facilities, located in Concord, California and Amersfoort, the Netherlands, and certain equipment and automobiles under non-cancelable operating leases with initial terms in excess of one year that require the Company to pay operating costs, property taxes, insurance and maintenance. The operating leases expire at various dates through 2030, with certain of the leases providing for renewal options, provisions for adjusting future lease payments based on the consumer price index, and the right to terminate the lease early. We do not assume renewals in our determination of the lease term unless the renewals are deemed to be reasonably assured at lease commencement. The Company recorded the lease right-of-use asset and obligation at the present value of lease payments over the lease term. The rates implicit in the Company’s leases are generally not readily determinable. The Company must estimate its incremental borrowing rate to discount the lease payments to present value. Operating lease assets also include lease incentives.

Supplemental cash flow information related to operating leases is as follows (dollars in thousands):

	Six Months Ended June 30, 2019
Cash payments for operating leases	\$ 1,693
Right-of-use assets obtained in exchange for operating lease obligations	12,865
	June 30, 2019
Weighted-average remaining lease term	9.7 years
Weighted-average discount rate	9.0%

Future minimum non-cancelable payments under operating leases as of June 30, 2019, were as follows (in thousands):

	Operating Leases
Remainder of 2019	\$ 1,819
2020	3,084
2021	3,113
2022	2,741
2023	2,617
Thereafter	18,690
Total future lease payments	\$ 32,064
Less imputed interest	11,631
Present value of lease liabilities	<u>\$ 20,433</u>

During the three months ended June 30, 2019 and 2018, the Company recorded operating lease expenses of \$0.9 million and \$0.3 million, respectively. During the six months ended June 30, 2019 and 2018, the Company recorded operating lease expenses of \$1.5 million and \$0.7 million, respectively. As of June 30, 2019, the Company had no leases that have not yet commenced.

Purchase Commitments

The Company is party to agreements with certain providers for certain components of the INTERCEPT Blood System. Certain of these agreements require minimum purchase commitments from the Company.

Note 7. Stockholders' Equity

Sales Agreement

On August 4, 2017, the Company entered into Amendment No. 3 to the Controlled Equity Offering SM Sales Agreement with Cantor Fitzgerald & Co. (as amended on August 4, 2017, the "Amended Cantor Agreement"). The Amended Cantor Agreement became effective on January 8, 2018, and provided for the issuance and sale of shares of the Company's common stock having an aggregate offering price of up to \$70.0 million through Cantor Fitzgerald & Co. ("Cantor"), which amount included the \$31.4 million of unsold shares of common stock available for sale immediately prior to the effectiveness of the Amended Cantor Agreement. Under the Amended Cantor Agreement, Cantor also acts as the Company's sales agent and receives compensation based on an aggregate of 2% of the gross proceeds on the sale price per share of its common stock. The issuance and sale of these shares by the Company pursuant to the Amended Cantor Agreement are deemed an "at-the-market" offering and are registered under the Securities Act of 1933, as amended. During the six months ended June 30, 2019, 2.0 million shares of the Company's common stock were sold under the Amended Cantor Agreement for net proceeds of \$9.8 million. At June 30, 2019, the Company had approximately \$31.5 million of common stock available to be sold under the Amended Cantor Agreement.

Note 8. Stock-Based Compensation

Employee Stock Plans

Employee Stock Purchase Plan

The Company maintains an Employee Stock Purchase Plan (the "Purchase Plan"), which is intended to qualify as an employee stock purchase plan within the meaning of Section 423(b) of the Internal Revenue Code. Under the Purchase Plan, the Company's Board of Directors may authorize participation by eligible employees, including officers, in periodic offerings. Under the Purchase Plan eligible employee participants may purchase shares of common stock of the Company at a purchase price equal to 85% of the lower of the fair market value per share on the start date of the offering period or the fair market value per share on the purchase date. The Purchase Plan consists of a fixed offering period of 12 months with two purchase periods within each offering period. At June 30, 2019, the Company had 0.7 million shares available for future issuance.

2008 Equity Incentive Plan and Inducement Plan

The Company also maintains an equity compensation plan to provide long-term incentives for employees, contractors, and members of its Board of Directors. The Company currently grants equity awards from one plan, the 2008 Equity Incentive Plan and its subsequent amendments (collectively, the "Amended 2008 Plan"). The Amended 2008 Plan allows for the issuance of non-statutory and incentive stock options, restricted stock, restricted stock units ("RSUs"), stock appreciation rights, other stock-related awards, and performance awards which may be settled in cash, stock, or other property. Option awards under the Amended 2008 Plan generally have a maximum term of 10 years from the date of the award. The Amended 2008 Plan generally requires options to be granted at 100% of the fair market value of the Company's common stock subject to the option on the date of grant. Options granted by the Company to employees generally vest over four years. RSUs are measured based on the fair market value of the underlying stock on the date of grant. RSUs granted by the Company to employees generally vest over three to four years. Performance-based stock or cash awards granted under the Amended 2008 Plan are limited to either 500,000 shares of common stock or \$1.0 million per recipient per calendar year. At June 30, 2019, 45,000 performance-based stock awards were outstanding.

At June 30, 2019, the Company had an aggregate of approximately 31.8 million shares of its common stock subject to outstanding options or unvested RSUs, or remaining available for future issuance under the Amended 2008 Plan, of which approximately 17.7 million shares and 4.2 million shares were subject to outstanding options and unvested RSUs, respectively, and approximately 9.9 million shares were available for future issuance under the Amended 2008 Plan. The Company's policy is to issue new shares of common stock upon the exercise of options or vesting of RSUs.

Activity under the Company's equity incentive plans related to stock options is set forth below (in thousands except per share amounts):

	Number of Options Outstanding	Weighted Average Exercise Price per Share
Balances at December 31, 2018	17,560	\$ 4.47
Granted	515	5.68
Exercised	(256)	2.99
Forfeited/canceled	(139)	4.99
Balances at June 30, 2019	<u>17,680</u>	<u>4.52</u>

Activity under the Company's equity incentive plans related to RSUs is set forth below (in thousands except per share amounts):

	Number of RSUs Unvested	Weighted Average Grant Date Fair Value per Share
Balances at December 31, 2018	2,001	\$ 4.56
Granted (1)	3,096	5.57
Vested	(850)	4.60
Forfeited	(55)	5.85
Balances at June 30, 2019	<u>4,192</u>	<u>5.28</u>

(1) Includes shares issuable under performance-based restricted stock unit awards.

Valuation Assumptions for Stock-based Compensation

The Company uses the Black-Scholes option pricing model to determine the grant-date fair value of stock options and employee stock purchase plan rights. The Black-Scholes option pricing model is affected by the Company's stock price, as well as assumptions regarding a number of complex and subjective variables, which include the expected term of the grants, actual and projected employee stock option exercise behaviors, including forfeitures, the Company's expected stock price volatility, the risk-free interest rate and expected dividends. The Company recognizes the grant-date fair value of the stock award as stock-based compensation expense on a straight-line basis over the requisite service period, which is the vesting period, and is adjusted for estimated forfeitures.

Note 9. Income Taxes

The Company recorded income tax expense of \$0.1 million for the three and six months ended June 30, 2019, primarily related to the operating income of the Company's Cerus Europe B.V. subsidiary. The Company recorded income tax expense of \$0.1 million for the three and six months ended June 30, 2018, primarily related to the operating income of the Company's Cerus Europe B.V. subsidiary.

Note 10. Development and License Agreements

Agreements with Fresenius

Fresenius Kabi AG ("Fresenius") manufactures and supplies the platelet and plasma systems to the Company under a supply agreement (the "Supply Agreement"). Fresenius is obligated to sell, and the Company is obligated to purchase, finished disposable kits for the Company's platelet and plasma systems and the Company's red blood cell system product candidate (the "RBC Sets"). The Supply Agreement permits the Company to purchase platelet and plasma systems and RBC Sets from third parties to the extent necessary to maintain supply qualifications with such third parties or where local or regional manufacturing is needed to obtain product registrations or sales. Pricing terms per unit are initially fixed and decline at specified annual production levels, and are subject to certain adjustments after the initial pricing term. Under the Supply Agreement, the Company maintains the amounts due from the components sold to Fresenius as a current asset on its accompanying condensed consolidated balance sheets until such time as the Company purchases finished disposable kits using those components. The Supply Agreement also requires the Company to make certain payments totaling €8.6 million ("Manufacturing and Development Payments") to Fresenius. In 2016, the Company paid €3.1 million to Fresenius. In August 2018, the Company entered into an amendment to the Supply Agreement accelerating the payment for the remaining €5.5 million to August 2019. Because these payments represent unconditional payment obligations, the Company recognized its liability for these payments at their net present value at discount rate of 9.72% based on the Company's effective borrowing rate at that time. The Manufacturing and Development Payments liability is accreted through interest expense based on the estimated timing of its ultimate settlement. As of June 30, 2019 and December 31, 2018, the Company accrued \$6.2

million (€ 5.5 million) and \$ 5.9 million (€ 5.2 million), respectively, related to the Manufacturing and Development Payments , which were included in “Manufacturing and development obligations –current” in the Company’s condensed consolidated balance sheets .

The Supply Agreement also requires the Company to make payments to support certain projects Fresenius has and will perform on behalf of the Company related to certain R&D activities and manufacturing efficiency activities for which certain assets have been established in the Company’s condensed consolidated balance sheets. The manufacturing efficiency asset is expensed on a straight-line basis over the life of the Supply Agreement. The prepaid asset related to amounts paid up front for the R&D activities to be conducted by Fresenius on behalf of the Company is expensed over the period which such activities occur. The following table summarizes the amounts of prepaid R&D asset and manufacturing efficiency asset at June 30, 2019 and December 31, 2018 (in thousands).

	June 30, 2019	December 31, 2018
Prepaid R&D asset – current (1)	\$ 46	\$ 47
Prepaid R&D asset – non-current (2)	2,152	2,156
Manufacturing efficiency asset (2)	1,472	1,594

- (1) Included in “Other current assets” in the Company’s condensed consolidated balance sheets.
(2) Included in “Other assets” in the Company’s condensed consolidated balance sheets.

The initial term of the Supply Agreement extends through July 1, 2025 (the “Initial Term”) and is automatically renewed thereafter for additional two year terms (each, a “Renewal Term”), subject to termination by either party upon (i) two years written notice prior to the expiration of the Initial Term or (ii) one year written notice prior to the expiration of any Renewal Term. Under the Supply Agreement, the Company has the right, but not the obligation, to purchase certain assets and assume certain liabilities from Fresenius.

The Company made payments to Fresenius of \$5.6 million and \$4.8 million relating to the manufacturing of the Company’s products during the three months ended June 30, 2019 and 2018, respectively, and \$13.4 million and \$10.2 million during the six months ended June 30, 2019 and 2018, respectively. The following table summarizes the amounts of the Company’s payables to and receivables from Fresenius at June 30, 2019 and December 31, 2018 (in thousands).

	June 30, 2019	December 31, 2018
Payables to Fresenius (1)	\$ 9,974	\$ 7,812
Receivables from Fresenius (2)	1,636	1,777

- (1) Included in “Accounts Payable” and “Accrued Liabilities” in the Company’s condensed consolidated balance sheets.
(2) Included in “Other current assets” in the Company’s condensed consolidated balance sheets.

Agreement with BARDA

In June 2016, the Company entered into an agreement with BARDA to support the Company’s development and implementation of pathogen reduction technology for platelet, plasma, and red blood cells.

The five-year agreement with BARDA and its subsequent modifications include a base period (the “Base Period”) and options (each, an “Option Period”) with committed funding of up to \$103.2 million for clinical development of the INTERCEPT Blood System for red blood cells (the “red blood cell system”), and the potential for the exercise by BARDA of subsequent Option Periods that, if exercised by BARDA and completed, would bring the total funding opportunity to \$201.2 million over the five-year contract period. If exercised by BARDA, subsequent Option Periods would fund activities related to broader implementation of the platelet and plasma system or the red blood cell system in areas of Zika virus risk, clinical and regulatory development programs in support of the potential licensure of the red blood cell system in the U.S., and development, manufacturing and scale-up activities for the red blood cell system. The Company is responsible for co-investment of \$5.0 million and would be responsible for an additional \$9.6 million, if certain Option Periods are exercised. BARDA will make periodic assessments of the Company’s progress and the continuation of the agreement is based on the Company’s success in completing the required tasks under the Base Period and each exercised Option Period. BARDA has rights under certain contract clauses to terminate the agreement, including the ability to terminate the agreement for convenience at any time.

As of June 30, 2019 and December 31, 2018, \$4.2 million and \$2.3 million, respectively, of billed and unbilled amounts were included in accounts receivable on the Company’s condensed consolidated balance sheets related to BARDA.

Note 11. Segment, Customer and Geographic Information

The Company continues to operate in only one segment, blood safety. The Company’s chief executive officer is the chief operating decision maker who evaluates performance based on the net revenues and operating loss of the blood safety segment. The Company

considers the sale of all of its INTERCEPT Blood System products to be similar in nature and function, and any revenue earned from services is minimal.

The Company's operations outside of the U.S. include a wholly-owned subsidiary headquartered in Europe. The Company's operations in the U.S. are responsible for the R&D and global and domestic commercialization of the INTERCEPT Blood System, while operations in Europe are responsible for the commercialization efforts of the platelet and plasma systems in Europe, the Commonwealth of Independent States and the Middle East. Product revenues are attributed to each region based on the location of the customer, and in the case of non-product revenues, on the location of the collaboration partner.

The Company had the following significant customers that accounted for more than 10% of the Company's total product revenue, during the three and six months ended June 30, 2019 and 2018:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Établissement Français du Sang	27%	39%	28%	40%
American Red Cross	15%	10%	14%	*

* Represents an amount less than 10% of product revenue.

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

This discussion and analysis should be read in conjunction with our unaudited condensed consolidated financial statements and the accompanying notes included in this Quarterly Report on Form 10-Q and the audited consolidated financial statements and accompanying notes included in our Annual Report on Form 10-K for the year ended December 31, 2018. Operating results for the three and six months ended June 30, 2019 are not necessarily indicative of results that may occur in future periods.

This Quarterly Report on Form 10-Q contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities and Exchange Act of 1934, as amended, that involve risks and uncertainties. The forward-looking statements are contained principally in this Item 2, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in Item 1A, "Risk Factors." These statements relate to future events or to our future operating or financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. These forward-looking statements may include, but are not limited to, statements about:

- future sales of and our ability to effectively commercialize and achieve market acceptance of the INTERCEPT Blood System, including our ability to comply with applicable United States, or U.S., and foreign laws, regulations and regulatory requirements;*
- our ability to successfully complete development, receive regulatory approvals and commercialize extended storage cryoprecipitate or other plasma derived biological products using the INTERCEPT Blood System;*
- our ability to manage the growth of our business and attendant cost increases, including in connection with the commercialization of the INTERCEPT Blood System in the U.S. and our international operations;*
- the timing or likelihood of regulatory submissions and approvals and other regulatory actions or interactions, including our anticipated approval of our CE Mark submission for the red blood cell system;*
- our ability to obtain and maintain regulatory approvals of the INTERCEPT Blood System;*
- our ability to obtain adequate clinical and commercial supplies of the INTERCEPT Blood System from our sole source suppliers for a particular product or component they manufacture;*
- the initiation, scope, rate of progress, results and timing of our ongoing and proposed preclinical and clinical trials of the INTERCEPT Blood System;*
- the successful completion of our research, development and clinical programs and our ability to manage cost increases associated with preclinical and clinical development of the INTERCEPT Blood System;*
- the amount and availability of funding we may receive under our agreement with the Biomedical Advanced Research and Development Authority, or BARDA;*
- our ability to transition distribution of the INTERCEPT Blood System from third parties to a direct sales model in certain international markets;*
- the ability of our products to inactivate the emerging viruses and other pathogens that we may target in the future;*
- our ability to protect our intellectual property and operate our business without infringing upon the intellectual property rights of others; and*
- our estimates regarding the sufficiency of our cash resources, our ability to continue as a going concern and our need for additional funding.*

In some cases, you can identify forward-looking statements by terms such as "anticipate," "will," "believe," "estimate," "expect," "plan," "may," "should," "could," "would," "project," "predict," "potential," and similar expressions intended to identify such forward-looking statements. Forward-looking statements reflect our current views with respect to future events, are based on assumptions, and are subject to risks and uncertainties. There can be no assurance that any of the events anticipated by forward-looking statements will occur or, if any of them do occur, what impact they will have on our business, results of operations and financial condition. Certain important factors could cause actual results to differ materially from those discussed in such statements, including the rate of customer adoption in the U.S. and our ability to achieve market acceptance of our products in the U.S. and international markets, whether our preclinical and clinical data or data from commercial use will be considered sufficient by regulatory authorities to grant marketing approvals for our products or for product extensions or additional claims for our products, our ability to obtain and maintain reimbursement approvals for our products, our ability to complete the development and testing of additional configurations or redesigns of our products, our need for additional financing and our ability to access funding under our agreement with BARDA, the impacts of regulation of our products by domestic and foreign regulatory authorities, our limited

experience in sales, marketing and regulatory support for the INTERCEPT Blood System, our reliance on Fresenius and third parties to manufacture or supply certain components or compounds for the INTERCEPT Blood System, incompatibility of our platelet system with some commercial platelet collection methods, our need to complete our red blood cell system's commercial design, more effective product offerings by, or clinical setbacks of, our competitors, product liability, our use of hazardous materials in the development of our products, business interruption due to earthquake, our expectation of continuing losses, protection of our intellectual property rights, volatility in our stock price, on-going compliance with the requirements of the Sarbanes-Oxley Act of 2002 and other factors discussed below and under the caption "Risk Factors" in Item 1A of this Quarterly Report on Form 10-Q. We discuss many of these risks in this Quarterly Report on Form 10-Q in greater detail in the section entitled "Risk Factors" under Part II, Item 1A below. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Also, forward-looking statements represent our estimates and assumptions only as of the date of this Quarterly Report on Form 10-Q. You should read this Quarterly Report on Form 10-Q and the documents that we incorporate by reference in and have filed as exhibits to this Quarterly Report on Form 10-Q completely. Our actual future results may be materially different from what we expect. Except as required by law, we assume no obligation to update or revise any forward-looking statements to reflect new information or future events, even if new information becomes available in the future. You should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.

Overview

Since our inception in 1991, we have devoted substantially all of our efforts and resources to the research, development, clinical testing and commercialization of the INTERCEPT Blood System. The INTERCEPT Blood System is designed for three blood components: platelets, plasma and red blood cells. The INTERCEPT Blood System for platelets, or platelet system, and the INTERCEPT Blood System for plasma, or plasma system, have received CE Marks and U.S. Food and Drug Administration, or FDA, approval and are being marketed and sold in a number of countries around the world. We sell both the platelet and plasma systems using our direct sales force and through distributors.

The platelet system is approved in the U.S. for ex vivo preparation of pathogen-reduced apheresis platelet components collected and stored in 100% plasma or InterSol in order to reduce the risk of transfusion-transmitted infection, or TTI, including sepsis, and as an alternative to gamma irradiation for prevention of transfusion-associated graft versus host disease or TA-GVHD. As part of the FDA's approval of the platelet system, we are required to successfully conduct and complete two post-approval studies - a haemovigilance study to evaluate the incidence of acute lung injury following transfusion of INTERCEPT treated platelets; and a recovery study of platelets treated with the platelet system that is currently being discussed with FDA. The plasma system is approved in the U.S. for ex vivo preparation of pathogen-reduced, whole blood derived or apheresis plasma in order to reduce the risk of TTI when treating patients requiring therapeutic plasma transfusion, and as an alternative to gamma irradiation for prevention of TA-GVHD.

The INTERCEPT Blood System for red blood cells, or the red blood cell system, is currently in development and has not been commercialized anywhere in the world. We announced the successful completion of our European Phase 3 clinical trial of our red blood cell system for acute anemia patients in January 2015, and in January 2018, we reported that the primary efficacy and safety endpoints were successfully achieved in our European Phase 3 clinical trial for chronic anemia patients. Based on the results of those trials, we filed for CE Mark approval in the European Union in December 2018. In the U.S., we successfully completed a Phase 2 recovery and lifespan study in 2014. In 2017, we initiated a Phase 3 clinical, double-blind study, known as the RedeS study, to assess the safety and efficacy of INTERCEPT treated red blood cells when compared to conventional, un-treated, red blood cells in regions impacted by the Zika virus epidemic. Also in 2017, we received investigational device exemption, or IDE, approval from the FDA to initiate a Phase 3 clinical trial, known as the ReCePI study that is designed to evaluate the efficacy and safety of INTERCEPT treated red blood cells in patients requiring transfusion for acute blood loss during surgery. In addition to successfully conducting and completing the RedeS and ReCePI studies, we will need to successfully conduct and complete an additional Phase 3 clinical trial for chronic anemia patients, including sickle-cell anemia patients, in the U.S. before the FDA will consider our red blood cell system for approval. We also understand that one or more additional *in vitro* studies will be required to be successfully completed and submitted to the FDA, prior to any initiation of a potential additional Phase 3 clinical trial. There can be no assurance that we will be able to successfully complete any such *in vitro* studies, nor can there be any assurance that we and the FDA will agree to any trial protocol we propose or that we will otherwise obtain FDA clearance to initiate a potential additional Phase 3 clinical trial. In addition, given the need to phenotypically match donations and patients and the existing burden of managing the production and supply to sickle-cell anemia patients, donor recruitment in a potential additional Phase 3 clinical trial may be difficult or impractical, which could significantly delay or preclude our ability to obtain any FDA approval of our red blood cell system. Although we plan to complete additional development activities to support CE Mark submission for the red blood cell system, such activities could prolong the development of our red blood cell system, and we do not expect to receive any regulatory approvals of our red blood cell system prior to 2022, if ever. We must demonstrate an ability to define, test and meet acceptable specifications for our current Good Manufacturing Practice, manufactured compounds used to prepare INTERCEPT treated red blood cells before we can submit and seek regulatory approval of our red blood cell system. We understand that while the data generated from our European Phase 3 clinical trials may be sufficient to receive CE Mark approval, we may need to generate additional safety data from commercial use in order to achieve broad market acceptance. In addition, these trials may need to be supplemented by additional, successful Phase 3 clinical trials for approval in certain countries. If such additional Phase 3 clinical trials are required, they would likely need to demonstrate equivalency of

INTERCEPT treated red blood cells compared to conventional, un-treated red blood cells and the significantly lower lifespan for INTERCEPT treated red blood cells compared to conventional, un-treated red blood cells may limit our ability to obtain any regulatory approvals in certain countries for the red blood cell system. As part of our development activities, we will need to successfully complete a number of *in vitro* studies prior to receiving any regulatory approvals in Europe and certain additional activities, including successfully completing the RedeS and ReCePI studies and an additional Phase 3 clinical trial for chronic anemia patients, including sickle-cell anemia patients, in the U.S., prior to receiving any regulatory approvals in the U.S. Successful completion of these activities may require capital beyond that which we currently have or that may be available to us under our agreement with the BARDA, and we may be required to obtain additional capital in order to complete the development of and obtain any regulatory approvals for the red blood cell system. In addition, if we are unable to obtain from our suppliers sufficient clinical quantities of the active compounds for our red blood cell system meeting defined quality and regulatory specifications or if our suppliers are not able to maintain regulatory compliance, we may experience delays in testing, conducting trials or obtaining approvals, and our product development costs would likely increase.

In 2016, we entered into a five-year agreement with BARDA, part of the U.S. Department of Health and Human Services' Office of the Assistant Secretary for Preparedness and Response, to receive funding from BARDA to support the development of our red blood cell system, including clinical and regulatory development programs in support of potential licensure, and development, manufacturing and scale-up activities, as well as activities related to broader implementation of all three INTERCEPT systems in areas of Zika virus risk. The RedeS and ReCePI studies are being funded as part of our agreement with BARDA. Under the contract, BARDA reimburses us for allowable direct contract costs, as such costs are incurred, and for allowable indirect costs. See the discussion under "BARDA" below for more information.

Our near-term capital requirements are dependent on various factors, including operating costs and working capital investments associated with developing and commercializing the INTERCEPT Blood System, including in connection with continuing U.S. commercialization of our platelet and plasma systems, costs to develop different configurations of existing products and new products, including our illuminator, costs associated with planning, enrolling and completing ongoing studies, and the post-approval studies we are required to conduct in connection with the FDA approval of the platelet system, costs associated with pursuing potential regulatory approvals in other geographies where we do not currently sell our platelet and plasma systems, costs associated with conducting *in vitro* studies and clinical development of our red blood cell system in Europe and the U.S., costs associated with performing the agreed-upon activities under our BARDA agreement, and costs related to creating, maintaining and defending our intellectual property. Our long-term capital requirements will also be dependent on the success of our sales efforts, competitive developments, the timing, costs and magnitude of our longer-term clinical trials and other development activities related to our platelet, plasma and red blood cell systems, including required post-approval studies for the platelet system, market preparedness and product launch activities for any of our products in geographies where we do not currently sell our products, and regulatory factors. Until we are able to generate a sufficient amount of product revenue and generate positive net cash flows from operations, which we may never do, meeting our long-term capital requirements is in large part reliant on continued access to funds under our BARDA agreement and the public and private equity and debt capital markets, as well as on collaborative arrangements with partners, augmented by cash generated from operations and interest income earned on the investment of our cash balances. While we believe that our available cash and cash equivalents and short-term investments, as well as cash received from product sales and under our agreement with BARDA, will be sufficient to meet our capital requirements for at least the next twelve months, if we are unable to generate sufficient product revenue, or access sufficient funds under our BARDA agreement or the public and private equity and debt capital markets, we may be unable to execute successfully on our operating plan. We have based our cash sufficiency estimate on assumptions that may prove to be incorrect. If our assumptions prove to be incorrect, we could consume our available capital resources sooner than we currently expect or in excess of amounts than we currently expect, which could adversely affect our commercialization and clinical development activities.

We have borrowed and in the future may borrow additional capital from institutional and commercial banking sources to fund future growth, including pursuant to our term loan agreement and revolving loan agreement with MidCap Financial Trust, or MidCap, as described below, or potentially pursuant to new arrangements with different lenders. We may borrow funds on terms that may include restrictive covenants, including covenants that restrict the operation of our business, liens on assets, high effective interest rates, financial performance covenants and repayment provisions that reduce cash resources and limit future access to capital markets. In addition, we expect to continue to opportunistically seek access to the equity capital markets to support our development efforts and operations. To the extent that we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. To the extent that we raise additional funds through collaboration or partnering arrangements, we may be required to relinquish some of our rights to our technologies or rights to market and sell our products in certain geographies, grant licenses on terms that are not favorable to us, or issue equity that may be substantially dilutive to our stockholders.

As a result of economic conditions, general global economic uncertainty, political change, and other factors, we do not know whether additional capital will be available when needed, or that, if available, we will be able to obtain additional capital on reasonable terms. If we are unable to raise additional capital due to the volatile global financial markets, general economic uncertainty or other factors, we may need to curtail planned development or commercialization activities. In addition, we may need to obtain additional funds to complete development activities for the red blood cell system necessary for potential regulatory approval in Europe, if costs are higher than anticipated or we encounter delays. We may need to obtain additional funding to conduct additional randomized controlled clinical trials for existing or new products, particularly if we are unable to access any additional portions of the funding contemplated by our BARDA agreement, and we may choose to defer such activities until we can obtain sufficient additional funding or, at such time our existing operations provide sufficient cash flow to conduct these trials .

Although we received FDA approval of our platelet and plasma systems in December 2014, our U.S. commercial efforts for 2019 will continue to be largely focused on implementing INTERCEPT at customers with whom we have previously signed agreements and continuing to develop awareness of INTERCEPT's product profile relative to other platelet and plasma products, including conventional, un-treated components. Significant product revenue from customers in the U.S. may not occur, if at all, until we have been able to successfully implement the platelet and plasma systems and demonstrate that they are economical, safe and efficacious for potential customers. In addition, to address the entire market in the U.S., we will need to develop, test and obtain FDA approval of additional configurations of the platelet system. We also plan to perform *in vitro* studies and seek a premarket approval, or PMA, supplement to use our plasma system to produce extended-storage cryoprecipitate and possibly other plasma derived biological products. We currently have agreements with certain blood center manufacturing partners and are actively working to identify additional partners to manufacture the extended-storage cryoprecipitate. We are also working on implementing the infrastructure we believe will be necessary to market an approved extended-storage cryoprecipitate product directly to hospitals subsequent to potential regulatory approval of any PMA supplement that we may propose to submit to the FDA. Even if we were to receive approval for a PMA supplement for extended storage cryoprecipitate, we may not receive label claims for all indications or for indications with the highest unmet need or market acceptance.

Outside of the U.S., we recognize product revenues from the sale of our platelet and plasma systems in a number of countries around the world including those in Europe, the Commonwealth of Independent States, or CIS, and the Middle East. In July 2017, we entered into agreements with Établissement Français du Sang, or EFS to supply illuminators and platelet and plasma disposable kits. We understand that the EFS has adopted the platelet system across France, but cannot provide any assurance that national usage is sustainable, since no purchase volume commitments have been made by EFS, in our current contract or otherwise. In addition, significant product revenue from the French market may decline or not consistently occur quarter-over-quarter. We cannot assure that the EFS will use the INTERCEPT Blood System for plasma at historical levels or at all. We also cannot provide any assurance that we will be able to secure any subsequent contracts with EFS or that the terms, including the pricing or committed volumes, if any, of any future contract will be equivalent or superior to the terms under our current contract.

If we are unable to gain widespread commercial adoption in markets where our blood safety products are approved for commercialization, including the U.S., we will have difficulties achieving profitability. In order to commercialize all of our products and product candidates, we will be required to conduct significant research, development, preclinical and clinical evaluation, commercialization and regulatory compliance activities for our products and product candidates, which, together with anticipated selling, general and administrative expenses, are expected to result in substantial losses. Accordingly, we may never achieve a profitable level of operations in the future.

In addition to the product revenues from sales of our platelet and plasma systems, we anticipate that we will continue to recognize revenue from our BARDA agreement. We recognize revenue associated with the BARDA agreement as qualified costs are incurred for reimbursement over the performance period.

Fresenius

Fresenius Kabi AG, or Fresenius, manufactures and supplies the platelet and plasma systems to us under a supply agreement, or the Supply Agreement. Fresenius is obligated to sell, and we are obligated to purchase, finished disposable kits for our platelet, plasma and red blood cell systems. The Supply Agreement permits us to purchase platelet, plasma and red blood cell systems from third parties to the extent necessary to maintain supply qualifications with such third parties or where local or regional manufacturing is needed to obtain product registrations or sales. Pricing terms are initially fixed and decline at specified annual production levels, and are subject to certain adjustments after the initial pricing term.

The Supply Agreement requires us to make certain payments totaling €8.6 million, or the Manufacturing and Development Payments, to Fresenius. In 2016, we paid €3.1 million to Fresenius. In August 2018, we entered into an amendment to the Supply Agreement, accelerating the payment for the remaining €5.5 million to August 2019. Because these payments represent unconditional payment obligations, we recognized our liability for these payments at their net present value using a discount rate of 9.72% based on our effective borrowing rate at that time. The Manufacturing and Development Payments liability is accreted through interest expense based on the timing of its ultimate settlement. As of June 30, 2019, we had accrued \$ 6.2 million (€5.5 million) related to the Manufacturing and Development Payments, which were included in “Manufacturing and development obligations – current” on our condensed consolidated balance sheets.

The initial term of the Supply Agreement extends through July 1, 2025, or the Initial Term, and is automatically renewed thereafter for additional two year terms, or Renewal Terms, subject to termination by either party upon (i) two years written notice prior to the expiration of the Initial Term or (ii) one year written notice prior to the expiration of any Renewal Term. Under the Supply Agreement, we have the right, but not the obligation, to purchase certain assets and assume certain liabilities from Fresenius. In the event that Fresenius refuses or is unable to continue operating under the Supply Agreement, we may be unable to maintain inventory levels or otherwise meet customer demand, and our business and operating results would be materially and adversely affected.

Likewise, if we conclude that supply of the INTERCEPT Blood System or components from Fresenius and others is uncertain, we may choose to build and maintain inventories of raw materials, work-in-process components, or finished goods, which would consume capital resources faster than we anticipate and may cause our supply chain to be less efficient. Like most regulated manufacturing processes, our ability to produce our products is dependent on our or our suppliers' ability to source components and raw materials which may at times be in short demand or obsolete. In such cases, we and/or Fresenius or other suppliers may need to source, qualify and obtain approval for replacement materials or components which would likely prove to be disruptive and consume capital resources sooner than we anticipate.

BARDA

In June 2016, we entered into an agreement with BARDA to support our development and implementation of pathogen reduction technology for platelet, plasma, and red blood cells, including access to funding that could potentially support various activities, including funding studies necessary to support a potential premarket approval application submission to the FDA for the red blood cell system, and acceleration of commercial scale up activities to facilitate potential adoption of the red blood cell system by U.S. blood centers.

The five-year agreement with BARDA and its subsequent modifications provide for the reimbursement of certain amounts incurred by us in connection with our satisfaction of certain contractual milestones. Under the agreement, we are reimbursed and recognize revenue as qualified direct contract costs are incurred plus allowable indirect costs, based on approved provisional indirect billing rates, which permit recovery of fringe benefits, overhead and general and administrative expenses. BARDA has committed to reimburse certain of our expenses related to the clinical development of the red blood cell system during a base period, or the Base Period, and under exercised option periods, or Option Periods, in an aggregate amount of up to \$103.2 million. If we satisfy subsequent milestones and BARDA were to exercise additional Option Periods, the total funding opportunity under the BARDA agreement could reach up to \$201.2 million over the five-year agreement period. If exercised by BARDA in its sole discretion, each subsequent Option Period would fund activities related to broader implementation of the platelet and plasma system or the red blood cell system in areas of Zika virus risk, clinical and regulatory development programs in support of the potential licensure of the red blood cell system in the U.S., and development, manufacturing and scale-up activities for the red blood cell system. We are currently responsible for co-investment of approximately \$5.0 million, and would be responsible for an additional \$9.6 million, if certain additional Option Periods are exercised by BARDA. BARDA will make periodic assessments of our progress and the continuation of the agreement is based on our success in completing the required tasks under the Base Period and each exercised Option Period. BARDA has rights under certain contract clauses to terminate the agreement, including the ability to terminate for convenience at any time.

Although BARDA has committed to reimburse us for up to \$103.2 million in expenses to date, we may not receive all of these funds if BARDA were to terminate the agreement. Amounts invoiced and currently payable under the BARDA agreement are subject to future audits at the discretion of the government. These audits could result in an adjustment to revenue previously reported, which potentially could be significant.

Cantor

See Note 7, *Stockholders' Equity*, in Part I of this Quarterly Report on Form 10-Q for further information regarding the sales agreement with Cantor Fitzgerald & Co. for the issuance and sale of the Company's common stock.

Critical Accounting Policies and Management Estimates

Critical accounting policies are those that require significant judgment and/or estimates by management at the time that the financial statements are prepared such that materially different results might have been reported if other assumptions had been made. We consider certain accounting policies related to revenue recognition, inventory, accrued expenses, goodwill and intangible assets, stock-based compensation and income taxes to be critical policies. See Note 1, *Summary of Significant Accounting Policies*, in Part I of this Quarterly Report on Form 10-Q for further discussion.

Results of Operations

Three and six months ended June 30, 2019 and 2018

Revenue

(in thousands, except percentages)	Three Months Ended June 30,			Six Months Ended June 30,			Change	
	2019	2018	Change	2019	2018	Change		
Product revenue	\$ 18,209	\$ 15,420	\$ 2,789	18%	\$ 35,713	\$ 28,984	\$ 6,729	23%
Government contract revenue	4,266	4,047	219	5%	8,727	7,502	1,225	16%
Total revenue	<u>\$ 22,475</u>	<u>\$ 19,467</u>	<u>\$ 3,008</u>	15%	<u>\$ 44,440</u>	<u>\$ 36,486</u>	<u>\$ 7,954</u>	22%

Product revenue increased during the three and six months ended June 30, 2019, compared to the three and six months ended June 30, 2018, primarily due to year-over-year sales volume growth in disposable kit sales in the U.S, the majority of which resulted from the increased adoption of the platelet system in the U.S., and increased disposable kit sales in the Middle East, partially offset by the product mix in France and the deterioration in the Euro relative to the U.S. dollar during the three and six months ended June 30, 2019, as compared to the three and six months ended June 30, 2018, as most product revenue has been invoiced and transacted in Euro, and reported in U.S. dollars.

We anticipate product revenue for INTERCEPT disposable kits will increase in future periods as a result of the expected expansion of U.S. sales as increased market acceptance of the INTERCEPT Blood System and adoption of the INTERCEPT Blood System in geographies where commercialization efforts are underway. However, a deterioration of the Euro relative to the U.S. dollar has in the past and could in the future have a material impact on our product revenues, as the majority of our product revenue is expected to come from Euro denominated markets over the near term. As a result of these and other factors, the historical results may not be indicative of INTERCEPT Blood System product revenue in the future.

We recognized \$4.3 million and \$8.7 million of revenue from our BARDA agreement during the three and six months ended June 30, 2019, respectively, and recognized \$4.0 million and \$7.5 million of revenue during the three and six months ended June 30, 2018, respectively, as a result of the direct and indirect contract costs incurred under the BARDA agreement. As our RedeS study continues to enroll patients, as we anticipate ramping other qualified clinical and development activities potentially increase under the exercised Option Periods, we anticipate that reported BARDA revenue will increase.

Cost of Product Revenue

Our cost of product revenue consists of the cost of the INTERCEPT Blood System sold, provisions for obsolete, slow-moving and unsaleable product, certain order fulfillment costs, to the extent applicable and costs for idle facilities. Inventory is accounted for on a first-in, first-out basis.

(in thousands, except percentages)	Three Months Ended June 30,			Six Months Ended June 30,			Change	
	2019	2018	Change	2019	2018	Change		
Cost of product revenue	\$ 8,111	\$ 7,720	\$ 391	5%	\$ 16,543	\$ 15,050	\$ 1,493	10%

Cost of product revenue increased during the three and six months ended June 30, 2019, compared to the three and six months ended June 30, 2018. The increase was primarily due to the increase of sales in the current period compared to the same period of the prior year, partially offset by favorable foreign exchange rates.

Our gross margin on product sales was 55% during the three months ended June 30, 2019, compared to 50% during the three months ended June 30, 2018. Our gross margin on product sales was 54% during the six months ended June 30, 2019, compared to 48% during the six months ended June 30, 2018. The increase in gross margin on product sales was primarily due to lower pricing from our contract manufacturer, improved product mix with respect to sales in France, and increased demand for platelet products.

Changes in our gross margin on product sales are affected by various factors, including the volume of product manufactured and the relative per unit pricing in our agreement with Fresenius, exchange rate of the Euro relative to the U.S. dollar, manufacturing and supply chain costs, the mix of product sold, and the mix of customers to which products are sold. We may encounter unforeseen manufacturing difficulties which, at a minimum, may lead to higher than anticipated costs, scrap rates, or delays in manufacturing products. In addition, we may face competition which may limit our ability to maintain existing selling prices for our products which in turn would negatively affect our reported gross margins on product sales. Our gross margins on product sales may be impacted in the future based on all of these and other criteria.

We expect to build inventory levels that will be sufficient to meet forecasted demand and plan to continue to manufacture at levels above those produced in 2018.

Research and Development Expenses

Our research and development expenses include salaries and related expenses for our scientific personnel, non-cash stock based compensation, payments to consultants, costs to prepare and conduct preclinical and clinical trials, third-party costs for development activities, certain regulatory costs, costs associated with our facility related infrastructure, and laboratory chemicals and supplies.

(in thousands, except percentages)	Three Months Ended June 30,			Change	Six Months Ended June 30,			Change
	2019	2018			2019	2018		
Research and development	\$ 14,417	\$ 9,881	\$ 4,536	46%	\$ 27,857	\$ 19,318	\$ 8,539	44%

Research and development expenses increased during the three and six months ended June 30, 2019, compared to the three and six months ended June 30, 2018, primarily due to the increased costs associated with clinical development of our INTERCEPT red blood cell system, increased costs associated with ensuring supply and compatibility for our products, and activities related to the BARDA agreement during the six months ended June 30, 2019.

We expect to incur additional research and development costs associated with planning, enrolling and completing our required post-approval studies for the platelet system, pursuing potential regulatory approvals in other geographies where we do not currently sell our platelet and plasma systems, planning and conducting *in vitro* studies and clinical development of our red blood cell system in Europe and the U.S., completing activities to support our CE Mark submission for our red blood cell system in Europe, new product development and product enhancements, including potential new label claims, and costs associated with performing the activities under our BARDA agreement. Due to the inherent uncertainties and risks associated with developing biomedical products, including, but not limited to, intense and changing government regulation, uncertainty of future preclinical studies and clinical trial results and uncertainty associated with manufacturing, it is not possible to reasonably estimate the costs to complete these research and development projects. We face numerous risks and uncertainties associated with the successful completion of our research and development projects, which risks and uncertainties are discussed in further detail under “Item 1A—*Risk Factors*” in Part II of this Quarterly Report on Form 10-Q.

Selling, General, and Administrative Expenses

Selling, general, and administrative expenses include salaries and related expenses for administrative personnel, non-cash stock based compensation, expenses for our commercialization efforts in a number of countries around the world including those in U.S., Europe, the CIS and the Middle East, Asia, Latin America, and expenses for accounting, tax, internal control, legal and facility and infrastructure related expenses, and insurance premiums.

(in thousands, except percentages)	Three Months Ended June 30,			Change	Six Months Ended June 30,			Change
	2019	2018			2019	2018		
Selling, general and administrative	\$ 16,740	\$ 14,437	\$ 2,303	16%	\$ 32,901	\$ 28,044	\$ 4,857	17%

Selling, general, and administrative expenses increased during the three and six months ended June 30, 2019, compared to the three and six months ended June 30, 2018, primarily due to investments in our manufacturing and supply chain capabilities. We anticipate our selling, general, and administrative spending to remain relatively consistent over the remainder of 2019.

Non-Operating Expense, Net

Non-operating expense, net consists of foreign exchange gains and losses, interest charges incurred on our debt, and other non-operating gains and losses, including interest earned from our short-term investment portfolio.

(in thousands, except percentages)	Three Months Ended June 30,				Six Months Ended June 30,			
	2019	2018	Change		2019	2018	Change	
Foreign exchange gain (loss)	\$ 105	\$ (138)	\$ 243	(176%)	\$ (57)	\$ (30)	\$ (27)	90%
Interest expense	(1,150)	(958)	(192)	20%	(4,074)	(1,873)	(2,201)	118%
Other income, net	337	444	(107)	(24%)	759	775	(16)	(2%)
Total non-operating expense, net	<u>\$ (708)</u>	<u>\$ (652)</u>	<u>\$ (56)</u>	9%	<u>\$ (3,372)</u>	<u>\$ (1,128)</u>	<u>\$ (2,244)</u>	199%

Foreign Exchange Loss

Foreign exchange gain (loss) remained relatively flat during the three and six months ended June 30, 2019, compared to the three and six months ended June 30, 2018, primarily due to stabilized foreign exchange rates for the Euro.

Interest Expense

Interest expense increased during the three months ended June 30, 2019, compared to the three months ended June 30, 2018, primarily due to the increased outstanding term loan amount. Interest expense increased during the six months ended June 30, 2019, compared to the six months ended June 30, 2018, primarily due to the loss of \$2.1 million on the extinguishment of the loan and security agreement, or the Oxford Term Loan Agreement, with Oxford Finance LLC. See *Note 5, Debt*, in Part I of this Quarterly Report on Form 10-Q for more information.

Other Income, Net

Other income, net decreased during the three and six months ended June 30, 2019, compared to the three and six months ended June 30, 2018, primarily due to the decrease of interest income from our investments in marketable securities.

Provision for Income Taxes

For the three and six months ended June 30, 2019 and 2018, we recorded tax expense of \$0.1 million, which was primarily a result of our Cerus Europe B.V. subsidiary's operating profit.

Due to our history of cumulative operating losses, management has concluded that, after considering all of the available objective evidence, it is not likely that all our net deferred tax assets will be realized. Accordingly, substantially all of our U.S. deferred tax assets continue to be subject to a valuation allowance as of June 30, 2019. As of June 30, 2019, there have been no material changes to our total amount of unrecognized tax benefits.

Liquidity and Capital Resources

In recent years, our sources of capital have primarily consisted of public issuance of common stock, debt instruments, and to a lesser extent, cash from product sales and reimbursements under our BARDA agreement.

At June 30, 2019, we had cash, cash equivalents, and restricted cash of \$26.2 million, of which \$23.5 million was included in cash and cash equivalents, and \$2.7 million was included as restricted cash. At December 31, 2018, we had cash, cash equivalents, and restricted cash of \$31.6 million, of which \$28.9 million was included in cash and cash equivalents, and \$2.7 million was included as restricted cash. Our cash equivalents primarily consist of money market instruments, which are classified for accounting purposes as available-for-sale. In addition, we had \$72.7 million of short-term investments at June 30, 2019, and \$88.7 million at December 31, 2018. We also had total indebtedness of approximately \$43.8 million under our Credit, Security and Guaranty Agreement (Term Loan), or the Term Loan Credit Agreement, and our Credit, Security and Guaranty Agreement (Revolving Loan), or the Revolving Loan Credit Agreement, both with MidCap Financial Trust, at June 30, 2019, and \$29.9 million under our Oxford Term Loan Agreement at December 31, 2018, respectively. Excess cash is typically invested in highly liquid instruments of short-term investments with high-quality credit rated corporate and government agency fixed-income securities in accordance with our investment policy.

Operating Activities

Net cash used in operating activities was \$35.1 million for the six months ended June 30, 2019, compared to \$19.3 million net cash used during the six months ended June 30, 2018. The increase in net cash used in operating activities was primarily related to the timing of accounts receivable collections, and the timing of payments and purchases related to inventories during the six months ended June 30, 2019, as compared to the same period in 2018.

Investing Activities

Net cash provided by investing activities was \$8.8 million for the six months ended June 30, 2019, compared to \$51.6 million net cash used by investing activities during the six months ended June 30, 2018. The change period over period was primarily the result of higher purchases of investments during the six months ended June 30, 2018, resulting from the proceeds from our January 2018 public offering of common stock, partially offset by capital expenditures related to our headquarters relocation.

Financing Activities

Net cash provided by financing activities was \$20.9 million during the six months ended June 30, 2019, compared to \$74.0 million net cash provided during the six months ended June 30, 2018. The decrease in net cash provided by financing activities was primarily due to the proceeds of approximately \$57.2 million, net of the underwriting discounts and other issuance costs, received from our January 2018 public offering of common stock, partially offset by the net principal proceeds of \$7.8 million received from the 2019 Term Loan described in more detail above during the six months ended June 30, 2019.

Working Capital

Working capital decreased to \$85.1 million at June 30, 2019, from \$94.2 million at December 31, 2018, primarily due to the cash used to support ongoing operations which resulted in lower cash and cash equivalent balances.

Capital Requirements

Our near-term capital requirements are dependent on various factors, including operating costs and working capital investments associated with commercializing the INTERCEPT Blood System, including in connection with the continuing U.S. commercial launch of our platelet and plasma systems, costs to develop different configurations of existing products and new products, including our illuminator, costs associated with planning, enrolling and completing ongoing studies, and the post-approval studies we are required to conduct in connection with the FDA approval of the platelet system, costs associated with pursuing potential regulatory approvals in other geographies where we do not currently sell our platelet and plasma systems, costs associated with conducting *in vitro* studies and clinical development of our red blood cell system in Europe and the U.S., costs associated with performing the agreed-upon activities under our BARDA agreement, and costs related to creating, maintaining and defending our intellectual property. Our long-term capital requirements will also be dependent on the success of our sales efforts, competitive developments, the timing, costs and magnitude of our longer-term clinical trials and other development activities related to our platelet, plasma and red blood cell systems, including required post-approval studies for the platelet system, market preparedness and product launch activities for any of our products in geographies where we do not currently sell our products, and regulatory factors. Until we are able to generate a sufficient amount of product revenue and generate positive net cash flows from operations, which we may never do, meeting our long-term capital requirements is in large part reliant on continued access to funds under our BARDA agreement and the public and private equity and debt capital markets, as well as on collaborative arrangements with partners, augmented by cash generated from operations and interest income earned on the investment of our cash balances. While we believe that our available cash and cash equivalents and short-term investments, as well as cash received from product sales and under our agreement with BARDA, will be sufficient to meet our capital requirements for at least the next twelve months, if we are unable to generate sufficient product revenue, or access sufficient funds under our BARDA agreement or the public and private equity and debt capital markets, we may be unable to execute successfully on our operating plan. We have based our cash sufficiency estimate on assumptions that may prove to be incorrect. If our assumptions prove to be incorrect, we could consume our available capital resources sooner than we currently expect or in excess of amounts than we currently expect, which could adversely affect our commercialization and clinical development activities.

We have borrowed and in the future may borrow additional capital from institutional and commercial banking sources to fund future growth, including pursuant to the Term Loan Credit Agreement or potentially pursuant to new arrangements with different lenders. We may borrow funds on terms that may include restrictive covenants, including covenants that restrict the operation of our business, liens on assets, high effective interest rates, financial performance covenants and repayment provisions that reduce cash resources and limit future access to capital markets. In addition, we expect to continue to opportunistically seek access to the equity capital markets to support our development efforts and operations. To the extent that we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. To the extent that we raise additional funds through collaboration or partnering arrangements, we may be required to relinquish some of our rights to our technologies or rights to market and sell our products in certain geographies, grant licenses on terms that are not favorable to us, or issue equity that may be substantially dilutive to our stockholders.

While we expect to receive significant funding under our agreement with BARDA, our ability to obtain the funding we expect to receive under the agreement is subject to various risks and uncertainties, including with respect to BARDA's ability to terminate the agreement for convenience at any time and our ability to achieve the required milestones under the agreement. In addition, access to federal contracts is subject to the authorization of funds and approval of our research plans by various organizations within the federal government, including the U.S. Congress. The general economic environment, coupled with tight federal budgets, has led to a general decline in the amount available for government funding. If BARDA were to eliminate, reduce or delay funding under our agreement, this would have a significant negative impact on the programs associated with such funding and could have a significant negative

impact on our revenues and cash flows. In addition, if we are unable to generate sufficient requisite Phase 3 clinical data and/or reach agreement with the FDA on a n additional Phase 3 clinical trial for chronic anemia in the U.S. for our red blood cell system, our agreement with BARDA will be severely limited in scope or could be terminated altogether, and our ability to complete the development activities required for licensure in the U.S. may require additional capital beyond which we currently have. If alternative sources of funding are not available, we may be forced to suspend or terminate development activities related to the red blood cell system in the U.S.

As a result of economic conditions, general global economic uncertainty, political change, and other factors, we do not know whether additional capital will be available when needed, or that, if available, we will be able to obtain additional capital on reasonable terms. If we are unable to raise additional capital due to the volatile global financial markets, general economic uncertainty or other factors, we may need to curtail planned development or commercialization activities. In addition, we may need to obtain additional funds to complete development activities for the red blood cell system necessary for potential regulatory approval in Europe, if costs are higher than anticipated or we encounter delays. We may need to obtain additional funding to conduct additional randomized controlled clinical trials for existing or new products, particularly if we are unable to access any additional portions of the funding contemplated by our BARDA agreement, and we may choose to defer such activities until we can obtain sufficient additional funding or, at such time, our existing operations provide sufficient cash flow to conduct these trials.

Commitments and Off-Balance Sheet Arrangements

Off-balance Sheet Arrangements

We did not have any off-balance sheet arrangements as of June 30, 2019.

Contractual Commitments

The following summarizes our contractual commitments at June 30, 2019 (in thousands):

Contractual Commitments	Total	1 year	2 - 3 years	4 - 5 years	After 5 years
Debt	\$ 58,165	\$ 7,791	\$ 11,536	\$ 38,838	\$ —
Operating leases	32,064	3,463	5,811	5,295	17,495
Minimum purchase requirements	22,968	12,730	6,265	966	3,007
Manufacturing and development obligations	6,251	6,251	—	—	—
Other commitments	123	90	33	—	—
Total contractual obligations	<u>\$ 119,571</u>	<u>\$ 30,325</u>	<u>\$ 23,645</u>	<u>\$ 45,099</u>	<u>\$ 20,502</u>

Debt

See *Note 5, Debt*, in Part I of this Quarterly Report on Form 10-Q for more information on the debt under our Term Loan Credit Agreement and the Revolving Loan Credit Agreement.

Operating Leases

See *Note 6, Commitments and Contingencies*, in Part I of this Quarterly Report on Form 10-Q for more information on the operating leases.

Minimum Purchase Requirements

Our minimum purchase commitments include certain components of our INTERCEPT Blood System which we purchase from third party manufacturers.

Manufacturing and Development Obligations

See “Fresenius” above for more information on the payment of €5.5 million which we are obligated to pay in August 2019 for an amendment to the Supply Agreement with Fresenius.

Other Commitments

Our other commitments primarily consist of obligations related to our landlord financed leasehold improvements, which are in addition to the leases we have for office and laboratory space. We pay for the financed leasehold improvements as a component of rent and are required to reimburse our landlords over the remaining life of the respective leases.

Financial Instruments

Our investment policy is to manage our marketable securities portfolio to preserve principal and liquidity while maximizing the return on the investment portfolio to assist us in funding our operations. We currently invest our cash and cash equivalents in money market funds and interest-bearing accounts with financial institutions. Our money market funds are classified as Level 1 in the fair value hierarchy, in which quoted prices are available in active markets, as the maturity of money market funds are relatively short and the carrying amount is a reasonable estimate of fair value. Our available-for-sale securities related to corporate debt and U.S. government agency securities are classified as Level 2 in the fair value hierarchy, which uses observable inputs to quoted market prices, benchmark yields, reported trades, broker/dealer quotes or alternative pricing sources with reasonable levels of price transparency. We maintain portfolio liquidity by ensuring that the securities have active secondary or resale markets. We did not record any other-than-temporary impairment losses during the six months ended June 30, 2019, or for the year ended December 31, 2018. Adverse global economic conditions have had, and may continue to have, a negative impact on the market values of potential investments.

New Accounting Pronouncements

See *Note 1, Summary of Significant Accounting Policies*, in Part I of this Quarterly Report on Form 10-Q for more information on new accounting pronouncements.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

During the six months ended June 30, 2019, there were no material changes to our market risk disclosures as set forth under, “Item 7A – *Quantitative and Qualitative Disclosures About Market Risk*,” in Part II of our Annual Report on Form 10-K for the year ended December 31, 2018.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We have carried out an evaluation under the supervision and with the participation of management, including our principal executive officer and principal financial officer, of our disclosure controls and procedures (as defined in Rule 13a-15(e) of the Securities Exchange Act of 1934, as amended) as of the end of the period covered by this Quarterly Report on Form 10-Q. Based on their evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of June 30, 2019.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting which occurred during our fiscal quarter ended June 30, 2019, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Limitations on the Effectiveness of Controls

A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues, if any, within a company have been detected. Accordingly, our disclosure controls and procedures are designed to provide reasonable assurance, not absolute assurance, that the objectives of our disclosure control system are met and, as set forth above, our principal executive officer and principal financial officer have concluded, that based on their evaluation as of the end of the period covered by this Quarterly Report on Form 10-Q, our disclosure controls and procedures were effective to provide reasonable assurance that the objective of our disclosure control system were met.

PART II: OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

None.

Item 1A. Risk Factors

Our business faces significant risks. If any of the events or circumstances described in the following risks actually occurs, our business may suffer, the trading price of our common stock could decline and our financial condition or results of operations could be harmed. These risks should be read in conjunction with the other information set forth in this report. The risks and uncertainties described below are not the only ones facing us. There may be additional risks faced by our business. Other events that we do not currently anticipate or that we currently deem immaterial also may adversely affect our financial condition or results of operations.

We depend substantially upon the commercial success of the INTERCEPT Blood System for platelets and plasma in the United States, or U.S., and our inability to successfully commercialize the INTERCEPT Blood System in the U.S. would have a material adverse effect on our business, financial condition, results of operations and growth prospects.

We have invested a significant portion of our efforts and financial resources on the development of the INTERCEPT Blood System for platelets and plasma for the U.S. market. As a result, our business is substantially dependent on our ability to successfully commercialize the INTERCEPT Blood System in the U.S. in a timely manner. In December 2014, we received U.S. regulatory approval of the INTERCEPT Blood System for platelets and plasma, with certain restrictions regarding usage, and although the INTERCEPT Blood System is now commercially available in the U.S., we have no prior experience commercializing any products in the U.S. and we may be unable to commercialize the INTERCEPT Blood System in the U.S. successfully or in a timely manner, or at all. The broad successful commercial adoption of any product, particularly involving novel technologies, is often dependent upon the seller earning a level of trust from and familiarity with customers, which can take time to develop. In addition, although we received FDA approval of our platelet and plasma systems in December 2014, our U.S. commercial efforts in 2019 will largely be focused on enabling blood centers that are using INTERCEPT to optimize production and increase the number of platelet and plasma units produced and made available to patients and continuing to develop awareness of INTERCEPT's product profile relative to other platelet and plasma products, including conventional, un-treated components. Significant product revenue from customers in the U.S. may not occur timely, if at all, until we have been able to successfully implement the platelet and plasma systems and demonstrate that they are economical, safe and efficacious for potential customers. Similar to our experience in foreign jurisdictions, some potential customers in the U.S. have chosen to first validate our technology or conduct other pre-adoption activities prior to purchasing or deciding whether to adopt the INTERCEPT Blood System for commercial use, which may never occur. In addition, potential customers and certain existing customers must obtain site-specific licenses from the Center for Biologics Evaluation and Research, or CBER, prior to engaging in interstate transport of blood components processed using the INTERCEPT Blood System. Delays in any customer obtaining their BLA approval could significantly delay or preclude our ability to successfully commercialize the INTERCEPT Blood System to those customers for the portion of their business involved in interstate commerce. In addition, significant changes to our product or the way in which our product is used may require that those customers file supplements or amendments to their site-specific licenses from CBER to continue to sell blood components processed using the INTERCEPT Blood System. U.S. blood centers will be limited to sales to hospital customers within the state in which the INTERCEPT-treated platelets or plasma are processed until they obtain the BLA licenses under the manner in which they use our product. Further, the hospital customers of any of our new blood center customers will need to go through the administrative process of generating internal tracking codes to integrate INTERCEPT-treated products into their inventories, which may further delay customer adoption in the U.S. The availability of platelets in the U.S. is currently constrained. Should U.S. blood centers prioritize obtaining and selling conventional, untreated platelet components over INTERCEPT-treated components, we may not achieve widespread market adoption. If we are not successful in achieving market adoption of the INTERCEPT Blood System in the U.S., we may never generate substantial product revenue, and our business, financial condition, results of operations and growth prospects would be materially and adversely affected.

Our ability to successfully commercialize the INTERCEPT Blood System for platelets and plasma in the U.S. will depend on our ability to:

- achieve market acceptance and generate product sales through execution of sales agreements on commercially reasonable terms;
- enter into and maintain sufficient manufacturing arrangements for the U.S. market with our third party suppliers;
- create market demand for the INTERCEPT Blood System through our education, marketing and sales activities;
- hire, train, deploy, support and maintain a qualified U.S.-based commercial organization and field sales force;
- expand the labeled indications of use for the INTERCEPT Blood System and/or design, develop, test and obtain regulatory approval for new product configurations;

- comply with requirements established by the FDA, including post-marketing requirements and label restrictions; and
- comply with other U.S. healthcare regulatory requirements.

In addition to the other risks described herein, our ability to successfully commercialize the INTERCEPT Blood System for platelets and plasma in the U.S. is subject to a number of risks and uncertainties, including those related to:

- the highly concentrated U.S. blood collection market that is dominated by a small number of blood collection organizations;
- availability of donors;
- regulatory and licensing requirements, including the CBER licensing process that U.S.-based blood centers are required to follow in order to obtain and maintain the required site-specific licenses to engage in interstate transport of blood components processed using the INTERCEPT Blood System;
- changed or increased regulatory restrictions or requirements;
- the amount available for reimbursement pursuant to codes we have obtained under the Healthcare Common Procedure Coding System, or HCPCS, and pricing for outpatient use of INTERCEPT-treated blood components;
- any supply or manufacturing problems or delays arising with any of our suppliers, many of whom are our sole suppliers for the particular product or component they manufacture, the ability of our suppliers to maintain FDA approval to manufacture the INTERCEPT Blood System and to comply with FDA-mandated current Good Manufacturing Practice, or cGMP, and Quality System Regulation, or QSR, requirements;
- successful customer transition to the disposable kits manufactured with the alternate plastics, as approvals are obtained;
- dependency upon any third party manufacturer that supplies products required by blood centers to process and store blood components consistent with our approved specifications and claims, including but not limited to, apheresis collection devices, disposable blood bags and reagents, and platelet additive solution, or PAS;
- changes in healthcare laws and policy, including changes in requirements for blood product coverage by U.S. federal healthcare programs; and
- acceptance of the INTERCEPT Blood System as safe, effective and economical from the broad constituencies involved in the healthcare system.

In addition to the above, our ability to successfully commercialize the INTERCEPT Blood System in the U.S. is dependent on our ability to operate without infringing on the intellectual property rights of others. For example, we are aware of a recently expired U.S. patent issued to a third-party that covers methods to remove psoralen compounds from blood products. We have reviewed the patent and believe there exist substantial questions concerning its validity. We cannot be certain, however, that a court would hold the patent to be invalid or not infringed by our platelet or plasma systems. In this regard, whether or not we have infringed this patent will not be known with certainty unless and until a court interprets the patent in the context of litigation. In the event that we are found to have infringed any valid claim of this patent, we may, among other things, be required to pay damages.

These and the other risks described below related to the commercialization of the INTERCEPT Blood System could have a material adverse effect on our ability to successfully commercialize the INTERCEPT Blood System for platelets and plasma in the U.S.

The INTERCEPT Blood System may not achieve broad market adoption.

In order to increase market adoption of the INTERCEPT Blood System and to increase market demand, we must address issues and concerns from broad constituencies involved in the healthcare system, from blood centers to patients, transfusing physicians, key opinion leaders, hospitals, private and public sector payors, regulatory bodies and public health authorities. We may be unable to demonstrate to these constituencies that the INTERCEPT Blood System is safe, effective and economical or that the benefits of using the INTERCEPT Blood System products justify their cost and outweigh their risks.

The use of the platelet system results in some processing loss of platelets. If the loss of platelets leads to increased costs, or the perception of increased costs for our customers, or if the use of our product in any way constrains the availability of blood due to platelet loss, or our customers or prospective customers believe that the loss of platelets reduces the efficacy of the transfusable unit, or our process requires changes in blood center or clinical regimens, prospective customers may not adopt our platelet system. Additionally existing customers may not believe they can justify any perceived operational change or inefficiency by itself or in conjunction with a blood component availability shortage. Certain customers that attempt to optimize collection practices from individual donors in order to increase the volume of transfusable units that can be treated with INTERCEPT from those collections may experience a less optimized yield as a result of adopting INTERCEPT as compared to collecting conventional platelet products.

Certain studies have indicated that transfusion of conventionally prepared platelets may yield higher post-transfusion platelet counts (according to a measurement called “corrected count increment”) and may be more effective than transfusion of INTERCEPT-treated platelets. Although certain other studies demonstrate that INTERCEPT-treated platelets retain therapeutic function comparable to conventional platelets, prospective customers may choose not to adopt our platelet system due to considerations relating to corrected count increment, efficacy or other factors.

The INTERCEPT Blood System does not inactivate all known pathogens, and the inability of the INTERCEPT Blood System to inactivate certain pathogens may limit its market adoption. For example, our products have not been demonstrated to be effective in the reduction of certain non-lipid-enveloped viruses, including hepatitis A and E viruses, due to these viruses’ biology. In addition, our products have not demonstrated a high level of reduction for human parvovirus B-19, which is also a non-lipid-enveloped virus. Although we have shown high levels of reduction of a broad spectrum of lipid-enveloped viruses, prospective customers may choose not to adopt our products based on considerations concerning inability to inactivate, or limited reduction, of certain non-lipid-enveloped viruses. Similarly, although our products have been demonstrated to effectively inactivate spore-forming bacteria, our products have not been shown to be effective in reducing bacterial spores once formed. In addition, our products do not inactivate prions since prions do not contain nucleic acid. While transmission of prions has not been a major problem in blood transfusions, and we are not aware of any competing products that inactivate prions, the inability to inactivate prions may limit market adoption of our products. Furthermore, due to limitations of detective tests, we cannot exclude that a sufficient quantity of pathogen or pathogens may still be present in active form, which could present a risk of infection to the transfused patient. Should INTERCEPT-treated components contain detectable levels of pathogens after treatment, the efficacy of INTERCEPT may be called into question, whether or not any remaining pathogens are the result of INTERCEPT’s efficacy or other factors. Such uncertainties may limit the market adoption of our products.

We have conducted studies of our products in both *in vitro* and *in vivo* environments using well-established tests that are accepted by regulatory bodies. When an *in vitro* test was not generally available or not well-established, we conducted *in vivo* studies in mammalian models to predict human responses. Although we have no reason to believe that the *in vitro* and *in vivo* studies are not predictive of actual results in humans, we cannot be certain that the results of these *in vitro* and *in vivo* studies accurately predict the actual results in humans in all cases. In addition, strains of infectious agents in living donors may be different from those strains commercially available or for which we have tested and for which we have received approval of the inactivation claims for our products. To the extent that actual results in human patients differ, commercially available or tested strains prove to be different, or customers or potential customers perceive that actual results differ from the results of our *in vitro* or *in vivo* testing, market acceptance of our products may be negatively impacted.

If customers experience operational or technical problems with the use of INTERCEPT Blood System products, market acceptance may be reduced or delayed. For example, if adverse events arise from incomplete reduction of pathogens, improper processing or user error, or if testing of INTERCEPT-treated blood samples fails to reliably confirm pathogen reduction, whether or not directly attributable to the INTERCEPT Blood System, customers may refrain from purchasing our products. Furthermore, should customers communicate operational problems or suspected product failure, we will need to investigate and report imputability to the relevant regulatory authorities in a timely manner. We or others may be required to file reports on such complaints or product failure before we have the ability to obtain conclusive data as to imputability which may cause concern with existing and prospective customers or regulators. For example, in connection with the nation-wide deployment of INTERCEPT platelets in France, our customer, Établissement Français du Sang, or EFS, has encountered instances of leakage in the disposable kits. Although the relative number of reports is not disproportionate to the number we have seen in other markets, because of the high number of new sites, and the high utilization rates throughout France, the absolute number of incidents has triggered a report to the French National Agency for Medicines and Health Products Safety, or ANSM. We have been working with EFS and will continue to work with EFS to investigate and address these reported leakage issues. We currently believe that our response to EFS has been satisfactory, but if EFS continues to experience leakages or if we are unable to successfully resolve any other product complaints from EFS in the future, EFS may stop using our products. In addition, the U.S. is currently experiencing a shortage of platelet components in many markets. Should customers feel that INTERCEPT treatment has a negative impact on the number of transfusable platelet units able to be manufactured from available donors, our ability to convince a blood center to treat increasing proportions of its platelet units may be negatively impacted. Moreover, there is a risk that further studies that we or others may conduct, including the post-approval studies we are required to conduct as a condition to the FDA approval of the platelet system, will show results inconsistent with previous studies. Should this happen, potential customers may delay or choose not to adopt our products and existing customers may cease use of our products. In addition, some hospitals may decide to purchase and transfuse both INTERCEPT-treated blood components and conventional blood components. Managing such a dual inventory of blood products may be challenging, and hospitals may need to amend their product labels and inventory management systems before being able to move forward with INTERCEPT. This may require coordination between hospital suppliers and blood centers, which in turn may cause delay in market adoption. Further, in certain markets, potential customers may require us to develop, sell, and support data management application software for their operations before they would consider adopting INTERCEPT. Such software development efforts may be costly or we may be unsuccessful in developing a data management application that would be broadly accepted. Developing, maintaining and supporting software can be time consuming, costly and may require resources and skill sets that we do not possess. Failure to do so may limit

market adoption in geographies where we commercialize the INTERCEPT Blood System, including the U.S. In addition, customers may require certain changes to our products for any number of reasons. Complying with such requests may prove costly, and may create complexities surrounding the manufacturing of the kits, compliance with regulatory authorities, blood center usage, or inventory management. Conversely, failure to comply with such requests from customers may result in damage to our relationship or the potential loss of customer business.

Market adoption of our products is affected by blood center and healthcare facility budgets and the availability of reimbursement from governments, managed care payors, such as insurance companies, and/or other third parties. In many jurisdictions, due to the structure of the blood products industry, we have little control over budget and reimbursement discussions, which generally occur between blood centers, healthcare facilities such as hospitals, and national or regional ministries of health and private payors. Even if a particular blood center is prepared to adopt the INTERCEPT Blood System, its hospital customers may not accept or may not have the budget to purchase INTERCEPT-treated blood products. Since blood centers would likely not eliminate the practice of screening donors or testing blood for some pathogens prior to transfusion, even after implementing our products, some blood centers may not be able to identify enough cost offsets or hospital pricing increases to afford to purchase our products. Budgetary concerns may be further exacerbated by economic legislation in certain countries and by proposals by legislators at both the federal and, in some cases, state levels, regulators, healthcare facilities and third party payors to keep healthcare costs down, which may limit the adoption of new technologies, including our products. In some jurisdictions, commercial use of our products may not be covered by governmental or commercial third party payors for health care services and may never be covered. Even if we received national reimbursement for our products, we may not be able to convince blood center customers to change their operating practices and produce INTERCEPT-treated platelets and plasma. In the U.S., we obtained HCPCS reimbursement codes for INTERCEPT-treated platelets and plasma in the outpatient setting in 2015. The costs and expenses incurred by the blood center related to donor blood are typically included in the price that the blood center charges a hospital for a unit of blood. Even after blood components treated with our products are approved for reimbursement by governmental or commercial third party payors, including under HCPCS codes, the costs and expenses related to use of the INTERCEPT Blood System will not be directly reimbursed, but instead may be incorporated within the reimbursement structure for medical procedures and/or products at the site of patient care. Governmental or third party payors may change reimbursement rates, year over year, or in reaction to submitted claims for reimbursement of costs and expenses related to blood components treated with INTERCEPT. If the costs to the hospital for INTERCEPT processed blood products cannot be easily, readily, or fully incorporated into the existing reimbursement structure, or if reimbursement rates are decreased in any given year for blood components treated with INTERCEPT, hospital billing and/or reimbursement for these products could be impacted, thus negatively impacting hospitals' acceptance and uptake of our products.

The market for the INTERCEPT Blood System is highly concentrated with few customers, including often-dominant regional or national blood collection entities. Even where our products receive regulatory approval and reimbursement is available, failure to effectively market, promote, distribute, price or sell our products to any of these customers could significantly delay or even diminish potential product revenue in those geographies. Moreover, the market for pathogen reduction systems in the U.S. is highly concentrated and dominated by a small number of blood collection organizations. In the U.S., the American Red Cross represents the largest single portion of the blood collection market. We cannot guarantee the long-term volume or timing of commercial purchases that the American Red Cross may make, if any, under our agreement. Our ability to gain significant market penetration in the U.S. is largely dependent on utilization of INTERCEPT and distribution of INTERCEPT-treated blood components by the American Red Cross. The American Red Cross is a large organization and broad-based utilization of INTERCEPT and distribution of INTERCEPT-treated products may be concentrated in a limited number of centers or may occur slowly, if at all. Conversely, given the large relative size of the American Red Cross, should they deploy the technology rapidly, our resources may be inadequate to fulfill the American Red Cross' and other customers' demands, which could result in a loss of product revenues or customer contracts, or both. In many countries in Western Europe and in Japan, various national blood transfusion services or Red Cross organizations collect, store and distribute virtually all of their respective nations' blood and blood components supply. In Europe, the largest markets for our products are in Germany, France, and England. In Germany, decisions on product adoption are made on a regional or even blood center-by-blood center basis, but depend on both local approvals and centralized regulatory approvals from the Paul Ehrlich Institute, or PEI. Obtaining these approvals requires support and coordination from local blood centers, and may take a significant period of time to obtain, if ever. Product specifications that receive marketing authorization from the PEI may differ from product specifications that have been adopted in other territories where we rely on CE Mark approval, thereby necessitating market specific modifications to the commercial product, which may not be economical or technically feasible for us. Following the inclusion of pathogen-inactivated platelets for national reimbursement by the German Institute for the Hospital Remuneration System as of January 1, 2018, German customers who do not currently have an approved marketing authorization application, or MAA, will first need to obtain one before using our product. The review period for a new MAA can be up to twelve months or longer following submission and we cannot assure that any of the potential German customers submitting a new MAA will obtain it. Without broad approvals of MAA applications obtained by potential German customers, our ability to successfully commercialize INTERCEPT in Germany will be negatively impacted, which may adversely affect our results of operations and financial results. In addition, the reimbursement awarded to INTERCEPT in Germany may not be considered by German blood centers as attractive enough to implement pathogen reduction or cover the entirety of their blood center platelet collections which may in turn limit the market acceptance in Germany. We do not yet know how German blood centers plan to market and sell to their hospital customers or which steps are needed at the

hospital level in Germany to administer pathogen-reduced platelets. Should German hospitals object, or are slow implementing the steps needed to procure and administer pathogen reduced platelets, our market in Germany may be limited or be slow to realize acceptance.

In July 2017, we entered into new agreements with the EFS to supply illuminators and platelet and plasma disposable kits. While the EFS has standardized production of its platelets using the INTERCEPT Blood System, we cannot provide any assurance that the national deployment of INTERCEPT in France will be sustainable or that we will be able to secure any subsequent contracts with EFS or that the terms, including the pricing or committed volumes, if any, of any future contract will be equivalent or superior to the terms under our current contract. If we are unable to successfully support EFS' national adoption of the INTERCEPT Blood System for platelets or the final commercial terms of any subsequent contract are less favorable than the terms under our existing contract, our financial results may be adversely impacted. Our existing contract with the EFS does not contain purchase volume commitments and as such, we may see variability in purchase levels or an altogether cessation. Our existing contract with the EFS provides for a base term of two years from July 2017 with two options for the EFS to extend for one year each. While EFS has exercised the first one-year extension option, we cannot assure that the EFS will exercise its remaining option, or continue to use the INTERCEPT Blood System at historical levels or at all.

In addition, we understand that the EFS will want to inspect and test samples of each lot that they anticipate purchasing from us prior to accepting the products shipped to fulfill orders. We may have little insight into the time to test, testing methods, testing conditions or ultimate results. Other customers may require similar conditions of purchase. Testing may have a negative impact on our ability to recognize product revenue either due to the time it takes to test and approve the release of a shipment or if the customer experiences problems with testing or if testing results are outside of the customer acceptance criteria.

In Japan, the Japanese Red Cross controls a significant majority of blood transfusions and exerts a high degree of influence on the adoption and use of blood safety measures in Japan. The Japanese Red Cross has been reviewing preclinical and clinical data on pathogen reduction of blood over a number of years and has yet to make a formal determination to adopt any pathogen reduction approach. We also understand that the Japanese Red Cross has begun formal evaluation of a competing technology. Before the Japanese Red Cross considers our products, we understand that we may need to commit to making certain product configuration changes, which are currently under development but may not be economically or technologically feasible for us to accomplish.

Significant increases in demand may occur given the concentrated nature of many of the largest potential customers and the potential for a mandate by public health agencies to adopt pathogen reduction technologies. Should those customers choose to adopt and standardize their production on the INTERCEPT Blood System or be required to adopt and standardize on the INTERCEPT Blood System, our ability to meet associated increases in demand may be constrained due to a variety of factors, including supply issues, manufacturing disruptions, availability of disposable kits manufactured from the obsolete plastic materials in jurisdictions that have not approved the alternate plastics, or other obsolescence of parts, among others. If we encounter such disruptions or supply shortages, we may have to allocate available products to customers, which could negatively impact our business and reputation or cause those customers to look for alternatives to the INTERCEPT Blood System.

We expect to continue to generate losses.

We may never achieve a profitable level of operations. Our cost of product sold, research and development and selling, general and administrative expenses have resulted in substantial losses since our inception. The platelet and plasma systems have been approved in the U.S. only since December 2014 and are not approved in many countries around the world. The red blood cell system is in the development stage and may never emerge from the development stage as a marketed product. We may be required to reduce the sales price for our products in order to make our products economically attractive to our customers and to governmental and private payors, or to compete favorably with other blood safety interventions or other pathogen reduction technologies, which may reduce or altogether eliminate any gross profit on sales. At our present and expected near-term sales levels of the platelet and plasma systems, our costs to manufacture, distribute, market, sell, and support the systems are and are expected to continue to be in excess of our product revenue. We expect our losses to continue at least until we are able to gain widespread commercial adoption, which may never occur. We expect to invest in research and development costs as we pursue a PMA supplement for extended-storage cryoprecipitate and hire employees and possibly retain contract resources to build a specialized commercial effort to sell that product directly to hospitals. Even if we were to receive approval for a PMA supplement for extended-storage cryoprecipitate, we may not receive label claims for all indications or for indications with the highest unmet need or market acceptance. We expect to incur additional research and development costs associated with the development of different configurations of existing product candidates and products including extended-storage cryoprecipitate and our illuminator, development of new products, planning, enrolling and completing ongoing clinical and non-clinical studies, including the post-approval studies we are required to conduct in connection with the FDA approval of the platelet system, pursuing potential regulatory approvals in other geographies where we do not currently sell our platelet and plasma systems, planning and conducting *in vitro* studies and clinical development of our red blood cell system in Europe and the U.S., and completing activities to support a potential CE Mark approval of our recent submission for our red blood cell

system in Europe. These costs could be substantial and could extend the period during which we expect to operate at a loss, particularly if we experience any difficulties or delays in completing the activities.

In certain countries, governments have issued regulations relating to the pricing and profitability of medical products and medical product companies. Healthcare reform in the U.S. has also placed downward pressure on the pricing of medical products that could have a negative impact on our profit margins.

Adverse market and economic conditions may exacerbate certain risks affecting our business.

Sales of our products are dependent on purchasing decisions of and/or reimbursement from government health administration authorities, distribution partners and other organizations. As a result of adverse conditions affecting the global economy and credit and financial markets, disruptions due to political instability or terrorist attacks, economies and currencies largely affected by declining commodity prices or otherwise, these organizations may defer purchases, may be unable to satisfy their purchasing or reimbursement obligations, or may delay payment for the INTERCEPT Blood System.

The sales of our products in Europe and CIS countries are denominated in Euros and other non-U.S. currencies. As a result, we are exposed to foreign exchange risk, and our results of operations have been and will continue to be impacted by fluctuations in the exchange rate between the U.S. dollar and other currencies, in particular the Euro. In addition, there have been concerns for the overall stability and suitability of the Euro as a single currency given the economic and political challenges facing individual Eurozone countries. Continuing deterioration in the creditworthiness of Eurozone countries, the withdrawal of, or the announcement of the withdrawal of, one or more member countries from the European Union, or E.U., following the United Kingdom's, or U.K.'s, referendum in which voters approved an exit from the E.U., or the failure of the Euro as a common European currency or an otherwise diminished value of the Euro could materially and adversely affect our product revenue.

In the past, a meaningful amount of our product revenue has come from sales to our distributor in Russia and other CIS countries. Weakness and/or instability in worldwide oil prices and the ongoing civil, political and economic disturbances in Russia, Turkey and Ukraine, and their spillover effect on surrounding areas, along with the impact of sanctions imposed against Russia by certain European nations and the U.S., have significantly devalued and may in the future significantly devalue the Russian Ruble and other CIS currencies and have had and may continue to have a negative impact on the Russian and other CIS countries' economies, particularly if sanctions continue to be levied against Russia or are strengthened from those currently in place from either the E.U., U.S. or both. For example, in 2017 and again in 2018, the Trump administration imposed sanctions against Russia, including sanctions targeting certain Russian individuals and entities. It is possible that Congress will consider or pass legislation imposing additional sanctions. While our agreement with our Russian and other CIS distributors calls for sales, invoicing and collections to be denominated in Euros, if significant sanctions continue or are strengthened, if new sanctions are imposed in connection with Russia's alleged interference in the U.S. election, its involvement in Syria or otherwise, if worldwide oil prices weaken and/or if measures taken by the Russian government to support the Ruble fail, the Russian economy and value of the Ruble or other CIS currencies may further weaken or remain weak, and our business in Russia and other CIS countries may be negatively impacted further or never recover to historical levels. Similarly, weak or unstable worldwide oil prices and current political conflicts may negatively impact potential future sales of our products in the Middle East and other oil producing exporters.

Moreover, the Trump administration has recently imposed tariffs on certain U.S. imports, and Canada, the E.U., China and other countries have responded with retaliatory tariffs on certain U.S. exports. We cannot predict what effects these and potential additional tariffs will have on our business, including in the context of escalating trade tensions. However, these tariffs and other trade restrictions could increase our operating costs, reduce our gross margins or otherwise negatively impact our financial results.

In addition, terrorist attacks and civil unrests in some of the countries where we do business, and the resulting need for enhanced security measures may impact our ability to deliver services, threaten the safety of our employees, and increase our costs of operations.

Our products, blood products treated with the INTERCEPT Blood System and we are subject to extensive regulation by domestic and foreign authorities. If our preclinical and clinical data are not considered sufficient by a country's regulatory authorities to grant marketing approval, we will be unable to commercialize our products and generate product revenue in that country. Our investigational red blood cell system requires extensive additional testing and development.

Our products, both those sold commercially and those under development are subject to extensive and rigorous regulation by local, state and federal regulatory authorities in the U.S. and by foreign regulatory bodies. These regulations are wide-ranging and govern, among other things:

- development;

- testing;
- manufacturing;
- labeling;
- storage;
- clinical trials;
- product safety;
- pre-market clearance or approval;
- sales and distribution;
- use standards and documentation;
- conformity assessment procedures;
- product traceability and record keeping procedures;
- post-launch surveillance and post-approval studies;
- quality;
- advertising and promotion;
- product import and export; and
- reimbursement.

Our products must satisfy rigorous standards of safety and efficacy and we must adhere to quality standards regarding manufacturing and customer-facing business processes in order for the FDA and international regulatory authorities to approve them for commercial use. For our product candidates, we must provide the FDA and international regulatory authorities with preclinical, clinical and manufacturing data demonstrating that our products are safe, effective and in compliance with government regulations before the products can be approved for commercial sale. The process of obtaining required regulatory approvals is expensive, uncertain and typically takes a number of years. We may continue to encounter significant delays or excessive costs in our efforts to secure necessary approvals or licenses, or we may not be successful at all. In addition, our labeling claims may not be consistent across markets. In addition, jurisdictions may differ in the definition of what constitutes a transfusable unit of platelets. We have developed our products with the aim to standardize the volume of platelets treatable by our system, wherever possible, which may not be accepted by all regulators or customers, may require additional data to support approval or which may not produce optimal transfusable blood components. For example, in certain jurisdictions, our approved label claims and the definition of a viable platelet unit for transfusion may allow for a significantly lower or higher platelet count per volume than other jurisdictions may allow. This variability in platelet count per volume may result in differences in platelet quality once processed and stored using INTERCEPT, and if customers experience sub-optimal platelet quality following INTERCEPT treatment, they may limit their adoption of INTERCEPT or consider adoption of competing blood safety technologies over INTERCEPT. In addition, our approved labels from the FDA limit our current approvals to certain platelet collection platforms and a particular storage solution for the particular collection platform. For instance, our FDA approved claims permit apheresis collection of platelets on the Fresenius Amicus device while stored in an additive solution or for apheresis collection of platelets collected on the Terumo Trima device and stored in 100% plasma. Such discrepant collection methodologies and storage solutions and conditions also exist for red blood cells. We may be required to provide the FDA with data for each permutation for which blood banking treatment practices exist which may be time consuming, costly and limit the potential size of the U.S. market that can use our products. In addition, in order to generate data that would be satisfactory to the FDA, we need to test our products with different blood center production configurations producing otherwise saleable products for the blood center. As such, we will generally need to purchase blood components which are expensive and may be limited during periods of low availability. For example, we continue to experience such availability constraints for platelets. Any such inability to procure blood components at a reasonable price, or at all, to conduct studies in order to generate data sufficient for label claim expansions may negatively impact our business opportunities.

Clinical and Preclinical

Clinical trials are particularly expensive and have a high risk of failure. Any of our trials may fail or may not achieve results sufficient to attain market acceptance, which could prevent us from achieving profitability. We do not know whether we will begin or complete clinical trials on schedule, if at all. Clinical trials can be delayed for a variety of reasons, including delays in obtaining regulatory approval to commence a study, delays in reaching agreement on acceptable clinical study agreement terms with prospective clinical sites, delays in obtaining institutional review board, ministry of health or ethics committee approval to conduct a study at a prospective clinical site, delays in recruiting subjects to participate in a study, delays in the conduct of the clinical trial by personnel at the clinical site or due to our inability to actively and timely monitor clinical trial sites because of travel restrictions, political instability, terrorist activity or concerns over employee safety. We have in the past restricted and may again in the future need to restrict travel to certain clinical trial sites for monitoring site visits or to otherwise manage the trial due to state department issued travel warnings, restrictions and severe weather. Significant delays in clinical testing could also materially impact our clinical trials. For example, enrollment and progress of the RedeS study are being conducted in areas subject to disruption by severe weather such as flooding or hurricane. We cannot be certain that delays in the RedeS study or other clinical trials will not occur. Criteria for regulatory approval in blood safety indications are evolving, reflecting competitive advances in the standard of care against which new product candidates are judged, as well as changing market needs and reimbursement levels. Clinical trial design, including enrollment criteria, endpoints and anticipated label claims are thus subject to change, even if original objectives are being met. As a result, we do not know whether any clinical trial will result in marketable products. Typically, there is a high rate of failure for product candidates in preclinical studies and clinical trials and products emerging from any successful trial may not reach the market for several years.

Enrollment criteria for certain of our clinical trials may be quite narrow, further delaying the clinical trial process. For instance, clinical trials previously conducted using INTERCEPT-treated plasma for patients with thrombotic thrombocytopenic purpura lasted approximately four years due in part to the difficulties associated with enrolling qualified patients. In addition, enrollment criteria have impacted the speed with which we were able to enroll patients in our European Phase 3 red blood cell system trial in chronic anemia patients and may impact other studies. Consequently, we may be unable to recruit suitable patients into clinical trials on a timely basis, if at all, which may lead to higher costs or the inability to complete the clinical trials. We cannot rely on interim results of trials to predict their final results, and acceptable results in early trials might not be repeated in later trials. Any trial may fail to produce results satisfactory to the FDA or foreign regulatory authorities. In addition, preclinical and clinical data can be interpreted in different ways, which could delay, limit or prevent regulatory approval. Negative or inconclusive results from a preclinical study or clinical trial, or adverse medical events during a clinical trial could cause a preclinical study or clinical trial to be repeated, require other studies to be performed or cause a program to be terminated, even if other studies or trials relating to a program are successful.

We have conducted many toxicology studies to demonstrate the safety of the platelet and plasma systems, and we have conducted and plan to conduct toxicology studies for the red blood cell system throughout the product development process. At any time, the FDA and other regulatory authorities may require further toxicology or other studies to further demonstrate our products' safety, which could delay or preclude regulatory approval and commercialization. In addition, the FDA or foreign regulatory authorities may alter guidance at any time as to what constitutes acceptable clinical trial endpoints or trial design, which may necessitate a redesign of our product or proposed clinical trials and cause us to incur substantial additional expense or time in attempting to gain regulatory approval. Regulatory agencies weigh the potential risks of using our pathogen reduction products against the incremental benefits, which may be difficult or impossible to quantify.

If any additional product candidates receive approval for commercial sale in the U.S., or if we obtain approval for expanded label claims for the platelet system or plasma system, the FDA may require one or more post-approval clinical or *in vitro* studies as a condition of approval, such as the post-approval clinical study we are required to conduct in connection with the approval of the platelet system and the additional post-approval study that we are required to conduct on recovery and survival of platelets suspended in 100% plasma in connection with the expanded label claim that we received for the platelet system. Each of these studies and any additional studies that the FDA may require could involve significant expense and may require us to secure adequate funding to complete. In addition, enrollment of post-marketing studies may be difficult to complete timely if customers of blood centers are reluctant to accept conventional, non-INTERCEPT-treated products once INTERCEPT products become available to them. Other regulatory authorities outside of the U.S. may also require post-marketing studies. Governments or regulatory authorities may impose new regulations or other changes or we may discover that we are subject to additional regulations that could further delay or preclude regulatory approval and subsequent adoption of our potential products. We cannot predict the adoption, implementation or impact of adverse governmental regulation that might arise from future legislative or administrative action. Furthermore, any guidance document or mandate that prescribes use of INTERCEPT may impose a compliance requirement on blood centers that operate and process blood components in a manner for which we do not yet have approved label claims. Our inability to meet such operational or processing constraints may impair our potential results permanently or until we are able to obtain such claims.

Outside the U.S., regulations vary by country, including the requirements for regulatory and marketing approvals or clearance, the time required for regulatory review and the sanctions imposed for violations. In addition to CE Mark documentation, countries outside the E.U. may require clinical data submissions, registration packages, import licenses or other documentation. Regulatory authorities in Japan, China, Taiwan, South Korea, Vietnam, Thailand, Singapore and elsewhere may require in-country clinical trial data, among other requirements, or that our products be widely adopted commercially in Europe and the U.S., or may delay such approval decisions until our products are more widely adopted. In addition to the regulatory requirements applicable to us and to our products, there are regulatory requirements in several countries around the world, including the U.S., Germany, Canada, Austria, Australia and other countries, applicable to prospective customers of INTERCEPT Blood System products and the blood centers that process and distribute blood and blood products. In those countries, blood centers and other customers are required to obtain approved license supplements from the appropriate regulatory authorities before making available blood products processed with our pathogen reduction systems to hospitals and transfusing physicians. Our customers may lack the resources or capability to obtain such regulatory approvals. For example, in the U.S., blood centers are required to obtain site-specific licenses from CBER prior to engaging in interstate transport of blood components processed using the INTERCEPT Blood System. In Germany, blood centers need to obtain marketing authorizations before they can submit for reimbursement or sell to hospitals. Significant product changes or changes in the way customers use our products may require amendments or supplemental approvals to licenses already obtained. Blood centers that do submit applications, supplements or amendments for manufacturing and sale may face disapproval or delays in approval that could further delay or deter them from using our products. The regulatory impact on potential customers could slow or limit the potential sales of our products.

Red Blood Cell System

While we have recently submitted for CE Mark approval of our red blood cell system, it has not been commercialized anywhere in the world. Significant development and financial resources will be required to progress the red blood cell system into a commercially viable product and to obtain the necessary regulatory approvals for the product. Final development of the red blood cell system may never occur and failure can occur any time during the process. Any failure or delay in completing the development activities for the red blood cell system would prevent or delay its commercialization, which could materially and adversely affect our business, financial condition, results of operations, growth prospects and potential future market adoption of any of our products, including the red blood cell system. Many of the factors described above that can contribute to the failure or delay of a clinical trial could impact the trials we conduct for our red blood cell system. Even if we are successful in earlier clinical trials, the results of those early trials may not be predictive of results obtained in later and larger clinical trials of the red blood cell system or the results of routine use if we are able to commercialize the red blood cell system. In those cases, the FDA or foreign regulatory agencies may require us to conduct additional clinical trials or further studies or analysis which may be costly and time-consuming. Furthermore, regulators may require clinical data for our red blood cell system under each collection and processing method using various additive or storage solutions before they would grant approval for any such configuration. The clinical data we have generated thus far and submitted for CE Mark approval does not support multiple configurations of collection processes, storage solutions and kits. If we are required to and are ultimately unable to collect data under each configuration or if we limit our pursuit of certain configurations over others, our market opportunity may be limited. In some instances, we are relying on contract research organizations and other third parties to assist us in designing, managing, monitoring and otherwise carrying out our clinical trials and development activities for the red blood cell system. We do not control these third parties and, as a result, they may not treat our activities as their highest priority, or in the manner in which we would prefer, which could result in delays, inefficient use of our resources and could distract personnel from other activities. Additionally, if we, our contract research organizations, other third parties assisting us or our study sites fail to comply with applicable good clinical practices, the clinical data generated in our trials may be deemed unreliable and the FDA or foreign regulatory agencies may require us to perform additional clinical trials before approving the red blood cell system for commercialization. We cannot assure you that, upon inspection, regulatory agencies will determine that any of our clinical trials comply with good clinical practices. In addition, our clinical trials must be conducted with product produced under the FDA's cGMP regulations and similar regulations outside of the U.S. Our failure or the failure of our product manufacturers to comply with these regulations may require us to repeat or redesign clinical trials, which would delay the regulatory approval process. We must be able to demonstrate stability of our active compounds manufactured under cGMP which meets release specifications. We have not been able to demonstrate that our product manufacturers or we are able to meet those requirements. If we are unable to demonstrate an ability to manufacture according to our specifications under cGMP with acceptable stability data, we may be unable to satisfy regulatory questions and requirements which could prevent or delay the potential approval of or our ability to commercialize the red blood cell system. In addition, existing lots of these red blood cell compounds manufactured under cGMP may be dispositioned by regulators or ourselves as unsuitable for either commercial or clinical use which would impact our ability to produce INTERCEPT-treated red blood cells for ongoing and future clinical trials and may require changes to the manufacturing process of our red blood cell compounds or new production of the compounds, all of which would be costly and time consuming and impact our ability to perform under our contract with BARDA. Following bankruptcy of one of our suppliers, we do not currently have a qualified manufacturer to produce a key reagent compound for our red blood cell system beyond our existing inventory levels, which are in insufficient quantity to complete our clinical trials or launch a product commercially. While we are in the process of identifying and qualifying manufactures of our red blood cell reagent, qualification of any alternate supplier will be time consuming and may cause delay in obtaining regulatory approval or commercialization and will cause us to incur additional cost. Unless we are able to obtain the release of our previously manufactured reagent under the cGMP requirements and qualify a new manufacturer prior to existing inventory levels expiring or running out with

the FDA's approval, we will have delays in completing our clinical trials or delays in supplying product for commercial use. Further, we are currently in the process of negotiating a commercial supply agreement with the manufacturer of the processing kits used in the red blood cell clinical trials. If we are unable to reach agreement on terms, our ability to complete the RedeS and ReCePI studies and any future Phase 3 clinical trials may be adversely impacted. There can be no guarantee that we will reach agreement or that, if an agreement is reached, that it will be on terms favorable to us.

In 2003, we terminated Phase 3 clinical trials evaluating a prior generation of the red blood cell system in acute and chronic anemia patients. The trials were terminated due to the detection of antibody reactivity to INTERCEPT-treated red blood cells in two patients in the 2003 chronic anemia trial. Although the antibody reactivity was not associated with any adverse events, we developed process changes designed to diminish the likelihood of antibody reactivity in red blood cells treated with our modified process. In a subsequent Phase 1 clinical trial that we initiated in the fourth quarter of 2008 to evaluate recovery and survival of treated red blood cells with the modified process, there were no adverse events reported. Based on the results from that trial, we obtained approval for and commenced two Phase 3 clinical trials in Europe using the modified process in patients with acute and chronic anemia, respectively. We successfully completed the European Phase 3 acute anemia clinical trial and the European Phase 3 chronic anemia clinical trial, with the INTERCEPT Blood System for red blood cells meeting its primary efficacy and safety endpoints in both trials. However, we cannot assure you that the adverse events observed in the terminated 2003 Phase 3 clinical trials of our earlier red blood cell system will not be observed in the future. In addition, although our completed European Phase 3 clinical trials in acute anemia patients and chronic anemia patients using our modified process met their primary endpoints, we cannot assure you that the same or similar results will be observed in current and potential future clinical trials using our modified process. We cannot assure that patients receiving INTERCEPT-treated red blood cells will not develop allergic reactions to the transfusion.

We will need to successfully conduct and complete license enabling Phase 3 clinical trials in the U.S. and to define a pathway toward generating sufficient chronic anemia data with the FDA for licensure. We are currently enrolling in two Phase 3 clinical trials in the U.S. However, enrollment in clinical trials can be difficult. For instance our ReCePI study in complex cardiovascular surgery patients has been slower to enroll due to a variety of factors including low frequency of administering red blood cells to the patient population. If we are unable to enroll a sufficient number of patients from the ReCePI study to generate the data needed for licensure, we will need to reach agreement with the FDA on a new pathway to generate sufficient data, including the potential for additional Phase 3 clinical trials beyond what is currently contemplated with the RedeS and ReCePI studies and in chronic anemia patients. Given the need to phenotypically match donations and patients and the existing burden of managing the production and supply to sickle-cell anemia patients, donor recruitment in a potential additional Phase 3 clinical trial in chronic anemia patients may be difficult or impractical, which could significantly delay or preclude our ability to obtain any FDA approval of our red blood cell system. In any event, there can be no assurance that we will be able to successfully complete these prerequisite Phase 3 clinical trials or otherwise generate sufficient Phase 3 clinical data, nor can there be any assurance that we and the FDA will agree to any trial protocol we propose or that we will otherwise obtain FDA clearance to initiate an additional Phase 3 clinical trial. In part, we will seek to introduce supplemental clinical data we obtained from European clinical trials, though we cannot assure you that we will be able to demonstrate comparability or that the FDA will allow supplemental clinical European data. The FDA will require us to place a clinical hold on any clinical trial if we see a hemolytic reaction associated with treatment emergent antibodies with amustaline specificity in patients receiving INTERCEPT-treated red blood cells in that trial. Should we experience such an incident, we will need to investigate the underlying cause of the hemolytic reaction, which in many patient populations may be difficult for us to assess imputability which may lead to a complete halt of the clinical trial, may irreparably harm our red blood cell product's reputation and may force us to suspend or terminate development activities related to the red blood cell system in the U.S., which would have a material adverse effect on our business and business prospects. Moreover, we do not currently have an approved protocol to investigate any antibody formation from S-303-treated red blood cells, should one occur. Our ability to successfully investigate the underlying cause of any detected anti-body, assess clinical significance and imputability will depend on having such a protocol in place prior to occurrence of such an event. Our clinical trials, RedeS and ReCePI, each allow for events where antibodies to amustaline (S-303) are detected in the absence of clinical hemolysis. Should we see three or more events where antibodies to amustaline (S-303) are formed without evidence of hemolysis, or a single event with clinical hemolysis, then completion of the study will be delayed or permanently halted until we can demonstrate that the antibodies were not clinically significant and the FDA and the Data and Safety Monitoring Board, or DSMB, agree to continue the study. To date, a single S-303 antibody event without evidence of hemolysis has been detected in the RedeS study. We do not yet know if the single S-303 antibody event was in the control or test arm, however the event is not clinically significant. In addition, if we are unable to generate sufficient prerequisite Phase 3 clinical data and/or reach agreement with the FDA on a Phase 3 clinical trial design for our red blood cell system, our agreement with BARDA will be severely limited in scope or could be terminated altogether, and our ability to complete the development activities required for licensure in the U.S. may require additional capital beyond that which we currently have. If alternative sources of funding are not available, we may be forced to suspend or terminate development activities related to the red blood cell system in the U.S.

We completed our European Phase 3 clinical trials of our red blood cell system for acute anemia patients and separately for chronic anemia patients . We filed our application for CE Mark approval of the red blood cell system in December 2018 and understand that we will have to file under the new Medical Device Regulations, or MDR, from the existing medical device directive . Accordingly, we do not expect to receive any regulatory approvals of our red blood cell system prior to 2022 , if ever. We understand that while the data generated from our European Phase 3 clinical trials may be sufficient to receive CE Mark approval, we may need to generate additional safety data from commercial use in order to achieve broad market acceptance . In addition, the European Phase 3 clinical trials in acute, and separately, chronic anemia patients, may need to be supplemented by additional, successful Phase 3 clinical trials for approval in certain countries. If such additional Phase 3 clinical trials are required, they would likely need to demonstrate equivalency of INTERCEPT-treated red blood cells compared to conventional , un-treated red blood cells and the significantly lower lifespan for INTERCEPT-treated red blood cells compared to conventional, un-treated red blood cells may limit our ability to obtain any regulatory approvals in certain countries for the red blood cell system . A number of trial design issues that could impact efficacy, regulatory approval and market acceptance will need to be resolved prior to the initiation of further clinical trials. In addition, if we are unable to secure the full amount of funding contemplated by the BARDA agreement for any reason, our ability to complete the development activities required for potential licensure in the U.S. may require additional capital beyond that which we currently have, and we may be required to obtain additional capital in order to complete the development of and obtain any regulatory approvals for the red blood cell system. Further, while we believe that our available cash and cash equivalents and short-term investments, as well as cash to be received from product sales and under our agreement with BARDA, will be sufficient to meet our capital requirements for at least the next twelve months, if we are unable to generate sufficient product revenue, or access sufficient funds under our BARDA agreement or the public and private equity and debt capital markets, we may be unable to execute successfully on our operating plan. If alternative sources of funding are not available, we may be forced to suspend or terminate development activities related to the red blood cell system in the U.S . which would have a material adverse effect on our business and business prospects. If we are unsuccessful in advancing the red blood cell system through clinical trials, resolving process and product design issues or in obtaining subsequent regulatory approvals and acceptable reimbursement rates, we may never realize a return on our R&D expenses incurred to date for the red blood cell system program. Regulatory delays can also materially impact our product development costs. If we experience delays in testing, conducting trials or approvals, our product development costs will increase , which costs may not be reimbursable to us under the BARDA agreement . Even if we were to successfully complete and receive approval for our red blood cell system, potential blood center customers may object to working with a potent chemical, like amustaline, the active compound in the red blood cell system, or may require modifications to automate the process, which would result in additional development costs, any of which could limit any market acceptance of the red blood cell system. If the red blood cell system were to face such objections from potential customers, we may choose to pay for capital assets, specialized equipment or personnel for the blood center, which would have a negative impact on any potential contribution margin from red blood cell system sales. Additionally, the use of the red blood cell system may result in some processing loss of red blood cells. If the loss of red blood cells leads to increased costs, or the perception of increased costs for potential customers, or potential customers believe that the loss of red blood cells reduces the efficacy of the transfusion unit, or our process requires changes in blood center or clinical regimens, potential customers may not adopt our red blood cell system even if approved for commercial sale.

Platelet and Plasma Systems

In 2007, we obtained a CE Mark approval from E.U. regulators for our platelet system, and have subsequently received a renewal in 2012 and again in 2017, in accordance with the five-year renewal schedule . We or our customers have received approval for the sale and/or use of INTERCEPT-treated platelets within Europe in France, Switzerland, Germany and Austria. We or our customers may also be required to conduct additional testing in order to obtain regulatory approval in countries that do not recognize the CE Mark as being adequate for commercializing the INTERCEPT Blood System in those countries. The level of additional product testing varies by country, but could be expensive or take a long time to complete. In addition, regulatory agencies are able to withdraw or suspend previously issued approvals due to changes in regulatory law, our inability to maintain compliance with regulations or other factors.

In 2006, we obtained a CE Mark approval from E.U. regulators for our plasma system, and have subsequently received a renewal in 2011 and again in 2016, in accordance with the five-year renewal schedule. We or our customers have received approval for the sale and/or use INTERCEPT-treated plasma within Europe in France, Switzerland, Germany and Austria. In some countries, including several in Europe, we or our customers may be required to perform additional clinical studies or submit manufacturing and marketing applications in order to obtain regulatory approval. If we or our customers are unable to obtain or maintain regulatory approvals for the use and sale or continued sale and use of INTERCEPT-treated platelets or plasma, market adoption of our products will be negatively affected and our growth prospects would be materially and adversely impacted.

The FDA has approved the platelet system for *ex vivo* preparation of pathogen-reduced apheresis platelet components collected and stored in InterSol and 100% plasma in order to reduce the risk of transfusion-transmitted infection, or TTI, including sepsis, and as an alternative to gamma irradiation for prevention of transfusion-associated graft versus host disease, or TA-GVHD. Additionally, the FDA approved the plasma system for *ex vivo* preparation of pathogen-reduced, whole blood derived or apheresis plasma in order to reduce the risk of TTI when treating patients requiring therapeutic plasma transfusion and as an alternative to gamma irradiation for prevention of TA-GVHD. We have conducted and are conducting additional *in vitro* studies for our platelet system to potentially expand our label claims to include, among others, platelets collected from pooled random donors, storage of INTERCEPT-treated platelets for up to seven days rather than five days, and a new processing set for triple dose collections. Failure to obtain any of these label expansion claims may negatively affect market adoption and our growth prospects would be materially and adversely affected.

As a condition to the initial FDA approval of the platelet system, we are required to conduct a post-approval clinical study of the platelet system. Successful enrollment and completion of this study requires that we develop sufficient INTERCEPT production capabilities with U.S. blood center customers. Delays in supplying INTERCEPT products to blood centers that are providing INTERCEPT-treated platelets to hospitals involved in the study may lead to increased costs to us and may jeopardize our ability to complete the study in a timeframe acceptable to the FDA. Furthermore, blood centers' ability to produce INTERCEPT-treated platelets and supply hospitals enrolled in the study may be negatively impacted by a shortage of overall platelet availability, constraints in producing platelets in compliance with our approved claims or operational inefficiencies experienced as a result of INTERCEPT treatment. In addition, we must identify and contract with hospitals that have the desire and ability to participate and contribute to the study in a timely manner and who are willing to purchase INTERCEPT-treated platelets from our blood center customers. If we are unable to complete this study, in a timely manner or at all, or the results of this study reveal unacceptable safety risks, we could be required to perform additional studies, which may be costly, and even lose U.S. marketing approval of the platelet system. Further, we are required to conduct a post-approval recovery and survival clinical study in connection with the label expansion approval for the use of the platelet system to treat platelets suspended in 100% plasma. Successful enrollment and completion of this additional study will also require that we identify and contract with hospitals that have the desire and ability to participate and contribute to the study in a timely manner and who are willing to purchase INTERCEPT-treated platelets from our blood center customers. If we are unable to complete this study, in a timely manner or at all, or the results of this study reveal unacceptable safety risks, we could be required to perform additional studies, which may be costly. In addition to these studies, the FDA may also require us to commit to perform other lengthy post-marketing studies, for which we would have to expend significant additional resources, which could have an adverse effect on our operating results, financial condition and stock price. In addition, there is a risk that these studies will show results inconsistent with our previous studies. Should this happen, potential customers may delay or choose not to adopt the INTERCEPT Blood System and existing customers may cease use of the INTERCEPT Blood System.

The execution and completion of the RedeS and ReCePI studies and planned or required clinical trials or studies will continue to result in additional costs, and will continue to require attention and resources from our clinical, regulatory and management teams, which may adversely affect our commercialization efforts and other regulatory and clinical programs.

Post-Marketing Approval

We are also required to continue to comply with applicable FDA and other regulatory requirements now that we have obtained approval for the INTERCEPT Blood System for platelets and plasma. These requirements relate to, among other things, labeling, packaging, storage, advertising, promotion, record-keeping and reporting of safety and other information. In addition, our manufacturers and their facilities are required to comply with extensive FDA and foreign regulatory agency requirements, including, in the U.S., ensuring that quality control and manufacturing procedures conform to cGMP and current QSR requirements. As such, we and our contract manufacturers are subject to continual review and periodic inspections. Accordingly, we and others with whom we work must continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production and quality control. We are required to report certain adverse events and production problems, if any, to the FDA and foreign regulatory authorities, when applicable, and must additionally comply with requirements concerning advertising and promotion for our products. For example, our promotional materials and training methods must comply with FDA and other applicable laws and regulations, including the prohibition of the promotion of unapproved, or off-label, use. If the FDA determines that our promotional materials or training constitutes promotion of an off-label use, it could request that we modify our training or promotional materials or subject us to regulatory or enforcement actions, including the issuance of an untitled letter, a warning letter, injunction, seizure, civil fine or criminal penalties. It is also possible that other federal, state or foreign enforcement authorities might take action if they consider our promotional or training materials to constitute promotion of an off-label use, or a violation of any other federal or state law that applies to us, such as laws prohibiting false claims for reimbursement. Any enforcement action brought by a federal, state or foreign authority could result in significant civil, criminal and/or administrative penalties, damages, fines, disgorgement, individual imprisonment, additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allocations of non-compliance with these laws, exclusion from participation in government programs, such as Medicare and Medicaid, injunctions, private "qui tam" actions brought by individual whistleblowers in the name of the government, or refusal to allow us to enter into government contracts, contractual damages, administrative burdens, and diminished profits and future earnings. In addition, our reputation could be damaged and

adoption of the products could be impaired. Although our policy is to refrain from statements that could be considered off-label promotion of our products, the FDA or another regulatory agency could disagree and conclude that we have engaged in off-label promotion. In addition, the off-label use of our products may increase the risk of product liability claims. Product liability claims are expensive to defend, divert our management's attention, result in substantial damage awards against us and harm our reputation. Regulatory authorities may also challenge the classification of our approvals for our products. For instance, we understand that the Dutch Competent Health Authority has questioned whether or not our products should be regulated as a drug instead of a medical device. While we and our notified body are confident in the current classification, we cannot assure you that regulators will conclude that our products should continue to be regulated as a medical device. Should we have to comply with drug regulations, we will incur additional costs, may need to generate additional data from studies to maintain approval and may be unable to comply timely, if ever.

Should a regulatory agency question a reported adverse event, we may not be able to rule out product failure as the cause, whether or not product failure is the cause of the reported adverse event. If a regulatory agency suspects or discovers problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility or the manufacturing process at the facility where the product is manufactured, or problems with the quality of product manufactured, or disagrees with the promotion, marketing, or labeling of a product, a regulatory agency may impose restrictions on use of that product, including requiring withdrawal of the product from the market. Our failure to comply with applicable regulatory requirements could result in enforcement action by regulatory agencies, which may include any of the following sanctions:

- adverse publicity, warning letters, fines, injunctions, consent decrees and civil penalties;
- repair, replacement, recall or seizure of our products;
- operating restrictions or partial suspension or total shutdown of production;
- delaying or refusing our requests for approval of new products, new intended uses or modifications to our existing products and regulatory strategies;
- refusal to grant export or import approval for our products;
- withdrawing marketing approvals that have already been granted, resulting in prohibitions on sales of our products; and
- criminal prosecution.

Any of these actions, in combination or alone, could prevent us from selling our products and harm our business. In addition, any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. Any failure to comply with ongoing or changing regulatory requirements may significantly and adversely affect our ability to successfully commercialize and generate additional product revenues from our platelet and plasma systems or any future products. If regulatory sanctions are applied or if regulatory approval is withdrawn, the value of our company and our operating results will be adversely affected. Additionally, if we are unable to continue to generate product revenues from the sale of our platelet and plasma systems, our potential for achieving operating profitability will be diminished and the need for additional capital to fund our operations will be increased.

Should we obtain approval of our red blood cell system, we will likely be required by regulators to collect additional data in patients receiving INTERCEPT-treated red blood cells. In addition, we may be required to develop a registry of patients receiving INTERCEPT-treated red blood cells for future data collection and evaluation. Should we become subject to such a requirement post-approval, we may incur significant costs to develop, create and implement such a registry. Further, introducing and implementing use of such a registry may face data collection challenges or resistance from transfusing physicians, hospitals or patients. We cannot ensure that the data collected in such a registry would support continued use of INTERCEPT-treated red blood cells.

In addition, the regulations to which we are subject are complex and have become more stringent over time. Regulatory changes could result in restrictions on our ability to carry on or expand our operations, increased operation costs or lower than anticipated sales. For instance, we understand that we will have to re-register our CE Marked products under the new MDR, (as required by all manufacturers who sell in Europe under a CE Mark), while we anticipate this will be a formality, there is always a possibility of new requirements.

A significant portion of the funding for the development of the red blood cell system is expected to come from our BARDA agreement, and if BARDA were to eliminate, reduce or delay funding from our agreement, this could have a significant, negative impact on our revenues and cash flows, and we may be forced to suspend or terminate our U.S. red blood cell development program or obtain alternative sources of funding.

We anticipate that a significant portion of the funding for the development of the red blood cell system will come from our agreement with BARDA. The agreement, including its subsequent modifications, provide for reimbursement of certain expenses incurred by us for up to approximately \$201.2 million to support the development of the red blood cell system. However, our agreement with BARDA only reimburses certain specified development and clinical activities that have been authorized by BARDA pursuant to the base period and certain options of the agreement and the potential exercise of subsequent option periods. To date, BARDA has committed approximately \$103.2 million under the base period of the agreement and options exercised. Accordingly, our ability to receive any of the additional \$98.0 million in funding provided for under the BARDA agreement is dependent on BARDA exercising additional options under the agreement, which it may do or not do at its sole discretion. In addition, BARDA is entitled to terminate our BARDA agreement for convenience at any time, in whole or in part, and is not required to provide continued funding beyond reimbursement of amounts currently incurred and obligated by us as a result of contract performance. Moreover, the continuation of our BARDA agreement depends in large part on our ability to meet development milestones previously agreed to with BARDA and on our compliance with certain operating procedures and protocols. BARDA may suspend or terminate the agreement should we fail to achieve key milestones, or fail to comply with the operating procedures and processes approved by BARDA and its audit agency. There can be no assurance that we will be able to achieve these milestones or continue to comply with these procedures and protocols. For instance, our RedeS study, which is being funded as part of our agreement with BARDA, is currently being conducted in areas subject to disruption by severe weather such as flooding or hurricane. Any severe weather to sites enrolling our clinical trials may negatively impact our ability to continue enrolling patients to complete our clinical trials. Our ability to meet the expectations of BARDA under our contract is largely dependent on our ability to attract, hire and retain personnel with competencies that are in short supply. In addition, in many instances we must identify third-party suppliers, negotiate terms acceptable to us and BARDA and ensure ongoing compliance by these suppliers with the obligations covered by our BARDA agreement. If we are unable to provide adequate supplier oversight or if suppliers are unable to comply with the requirements of the agreement, our ability to meet the anticipated milestones may be impaired. There can also be no assurance that our BARDA agreement will not be terminated, that our BARDA agreement will be extended through the exercise of subsequent option periods, that any such extensions would be on terms favorable to us, or that we will otherwise obtain the funding that we anticipate to obtain under our agreement with BARDA. Moreover, changes in government budgets and agendas may result in a decreased and deprioritized emphasis on supporting the development of pathogen reduction technology. If our BARDA agreement is terminated or suspended, if there is any reduction or delay in funding under our BARDA agreement, or if BARDA determines not to exercise some or all of the options provided for under the agreement, our revenues and cash flows could be significantly and negatively impacted and we may be forced to seek alternative sources of funding, which may not be available on non-dilutive terms, terms favorable to us or at all. If alternative sources of funding are not available, we may be forced to suspend or terminate development activities related to the red blood cell system in the U.S.

In addition, under the BARDA agreement, BARDA will regularly review our development efforts and clinical activities. Under certain circumstances, BARDA may advise us to delay certain activities and invest additional time and resources before proceeding. If we follow such BARDA advice, overall red blood cell program delays and costs associated with additional resources for which we had not planned may result. Also, the costs associated with following such advice may or may not be reimbursed by BARDA under our agreement. Finally, we may decide not to follow the advice provided by BARDA and instead pursue activities that we believe are in the best interests of our red blood cell program and our business, even if BARDA would not reimburse us under our agreement.

Unfavorable provisions in government contracts, including in our contract with BARDA, may harm our business, financial condition and operating results.

U.S. government contracts typically contain unfavorable provisions and are subject to audit and modification by the government at its sole discretion, which will subject us to additional risks. For example, under our agreement with BARDA, the U.S. government has the power to unilaterally:

- audit and object to any BARDA agreement-related costs and fees on grounds that they are not allowable under the Federal Acquisition Regulation, or FAR, and require us to reimburse all such costs and fees;
- suspend or prevent us for a set period of time from receiving new contracts or grants or extending our existing agreement based on violations or suspected violations of laws or regulations;
- claim nonexclusive, nontransferable rights to product manufactured and intellectual property developed under the BARDA agreement and may, under certain circumstances involving public health and safety, license such inventions to third parties without our consent;
- cancel, terminate or suspend our BARDA agreement based on violations or suspected violations of laws or regulations;

- terminate our BARDA agreement in whole or in part for the convenience of the government for any reason or no reason, including if funds become unavailable to the U.S. Department of Health and Human Services' Office of the Assistant Secretary for Preparedness and Response;
- reduce the scope and value of our BARDA agreement;
- decline to exercise an option to continue the BARDA agreement;
- direct the course of the development of the red blood cell system in a manner not chosen by us;
- require us to perform the option periods provided for under the BARDA agreement even if doing so may cause us to forego or delay the pursuit of other red blood cell program opportunities with greater commercial potential;
- take actions that result in a longer development timeline than expected;
- limit the government's financial liability to amounts appropriated by the U.S. Congress on a fiscal-year basis, thereby leaving some uncertainty about the future availability of funding for the red blood cell program even after it has been funded for an initial period; and
- change certain terms and conditions in our BARDA agreement.

Generally, government contracts, including our agreement with BARDA, contain provisions permitting unilateral termination or modification, in whole or in part, at the U.S. government's convenience. Termination-for-convenience provisions generally enable us to recover only our costs incurred or committed (plus a portion of the agreed fee) and settlement expenses on the work completed prior to termination. Except for the amount of services received by the government, termination-for-default provisions do not permit recovery of fees. In addition, in the event of termination or upon expiration of our BARDA agreement, the U.S. government may dispute wind-down and termination costs and may question prior expenses under the contract and deny payment of those expenses. Should we choose to challenge the U.S. government for denying certain payments under our BARDA agreement, such a challenge could subject us to substantial additional expenses that we may or may not recover. Further, if our BARDA agreement is terminated for convenience, or if we default by failing to perform in accordance with the contract schedule and terms, a significant negative impact on our cash flows and operations could result.

In addition, government contracts normally contain additional requirements that may increase our costs of doing business and expose us to liability for failure to comply with these terms and conditions. These requirements include, for example:

- specialized accounting systems unique to government contracts;
- mandatory financial audits and potential liability for price adjustments or recoupment of government funds after such funds have been spent;
- public disclosures of certain contract information, which may enable competitors to gain insights into our research program;
- mandatory internal control systems and policies; and
- mandatory socioeconomic compliance requirements, including labor standards, non-discrimination and affirmative action programs and environmental compliance requirements.

If we fail to maintain compliance with these requirements, we may be subject to potential liability and to the termination of our BARDA agreement.

Furthermore, we have entered into and will continue to enter into agreements and subcontracts with third parties, including suppliers, consultants and other third-party contractors, in order to satisfy our contractual obligations under our BARDA agreement. Negotiating and entering into such arrangements can be time-consuming and we may not be able to reach agreement with such third parties. Any such agreement must also be compliant with the terms of our BARDA agreement. Any delay or inability to enter into such arrangements or entering into such arrangements in a manner that is non-compliant with the terms of our contract, may result in violations of our BARDA agreement.

As a result of the unfavorable provisions in our BARDA agreement, we must undertake significant compliance activities. The diversion of resources from our development and commercial programs to these compliance activities, as well as the exercise by the U.S. government of any rights under these provisions, could materially harm our business.

Laws and regulations affecting government contracts, including our BARDA agreement, make it more costly and difficult for us to successfully conduct our business. Failure to comply with these laws and regulations could result in significant civil and criminal penalties and adversely affect our business.

We must comply with numerous laws and regulations relating to the administration and performance of our BARDA agreement. Among the most significant government contracting regulations are:

- the FAR and agency-specific regulations supplemental to the FAR, which comprehensively regulate the procurement, formation, administration and performance of government contracts;
- the business ethics and public integrity obligations, which govern conflicts of interest and the hiring of former government employees, restrict the granting of gratuities and funding of lobbying activities and incorporate other requirements such as the Anti-Kickback Statute, the Procurement Integrity Act, the False Claims Act and the U.S. Foreign Corrupt Practices Act;
- export and import control laws and regulations; and
- laws, regulations and executive orders restricting the exportation of certain products and technical data.

In addition, as a U.S. government contractor, we are required to comply with applicable laws, regulations and standards relating to our accounting practices and are subject to periodic audits and reviews. As part of any such audit or review, the U.S. government may review the adequacy of, and our compliance with, our internal control systems and policies, including those relating to our purchasing, property, estimating, compensation and management information systems. Based on the results of its audits, the U.S. government may adjust our BARDA agreement-related costs and fees, including allocated indirect costs. This adjustment could impact the amount of revenues reported on a historic basis and could impact our cash flows under the contract prospectively. In addition, in the event BARDA determines that certain costs and fees were unallowable or determines that the allocated indirect cost rate was higher than the actual indirect cost rate, BARDA would be entitled to recoup any overpayment from us as a result. In addition, if an audit or review uncovers any improper or illegal activity, we may be subject to civil and criminal penalties and administrative sanctions, including termination of our BARDA agreement, forfeiture of profits, suspension of payments, fines and suspension or prohibition from doing business with the U.S. government. We could also suffer serious harm to our reputation if allegations of impropriety were made against us, which could cause our stock price to decline. In addition, under U.S. government purchasing regulations, some of our costs may not be reimbursable or allowed under our contracts. Further, as a U.S. government contractor, we are subject to an increased risk of investigations, criminal prosecution, civil fraud, whistleblower lawsuits and other legal actions and liabilities as compared to private sector commercial companies.

If we or our third-party suppliers fail to comply with the FDA's or other regulatory agency's good manufacturing practice regulations, it could impair our ability to market our products in a cost-effective and timely manner.

In order to be used in clinical studies or sold in the U.S., our products are required to be manufactured in FDA-approved facilities. If any of our suppliers fail to comply with FDA's cGMP regulations or otherwise fail to maintain FDA approval, we may be required to identify an alternate supplier for our products or components. Our products are complex and difficult to manufacture. Finding alternate facilities and obtaining FDA approval for the manufacture of the INTERCEPT Blood System at such facilities would be costly and time-consuming and would negatively impact our ability to generate product revenue from the sale of our platelet or plasma system in the U.S. and achieve operating profitability. Our red blood cell system also needs to be manufactured in FDA-approved facilities, several of which, are not currently FDA-approved. Failure of our suppliers to meet cGMP regulations and failure to obtain or maintain FDA approval will negatively impact our ability to achieve FDA approval for our red blood cell system or may require that we identify, qualify and contract with alternative suppliers, if they are available, which would be time consuming, costly and result in further approval delays.

We and our third-party suppliers are also required to comply with the cGMP and QSR requirements, which cover the methods and documentation of the design, testing, production, control, quality assurance, labeling, packaging, sterilization, storage and shipping of our products. The FDA and other regulatory agencies audit compliance with cGMP and QSR requirements through periodic announced and unannounced inspections of manufacturing and other facilities. These audits and inspections may be conducted at any time. If we or our suppliers fail to adhere to cGMP and QSR requirements, have significant non-compliance issues or fail to timely and adequately respond to any adverse inspectional observations or product safety issues, or if any corrective action plan that we or our suppliers propose in response to observed deficiencies is not sufficient, the FDA or other regulatory agency could take enforcement action against us, which could delay production of our products and may include:

- untitled letters, warning letters, fines, injunctions, consent decrees and civil penalties;
- unanticipated expenditures to address or defend such actions;
- customer notifications or repair, replacement, refunds, recall, detention or seizure of our products;
- operating restrictions or partial suspension or total shutdown of production;
- refusing or delaying our requests for premarket approval of new products or modified products;

- withdrawing marketing approvals that have already been granted;
- refusal to grant export or import approval for our products; or
- criminal prosecution.

Any of the foregoing actions could have a material adverse effect on our reputation, business, financial condition and operating results. Furthermore, our key suppliers may not continue to be in compliance with all applicable regulatory requirements, which could result in our failure to produce our products on a timely basis and in the required quantities, if at all. In this regard, one of our component suppliers for our red blood cell system has been unable to maintain its production facility in accordance with cGMP requirements. As a result, unless we are able to obtain the release of previously manufactured components under the cGMP requirements, we may have delays in completing our clinical trials or delays in supplying product for commercial use. In addition, before any additional products would be considered for marketing approval in the U.S. or elsewhere, our suppliers will have to pass an audit by the FDA or other regulatory agencies. We are dependent on our suppliers' cooperation and ability to pass such audits. Such audits and any audit remediation may be costly. Failure to pass such audits by any of our suppliers would affect our ability to obtain licensure in the U.S. or elsewhere.

If we modify our FDA-approved products, we may need to seek additional approvals, which, if not granted, would prevent us from selling our modified products.

Any modifications to the platelet and plasma systems that could significantly affect their safety or effectiveness, including significant design and manufacturing changes, or that would constitute a major change in their intended use, manufacture, design, components, or technology requires approval of a new premarket approval application, or PMA, or PMA supplement. However, certain changes to a PMA-approved device do not require submission and approval of a new PMA or PMA supplement and may only require notice to FDA in a PMA Annual Report. The FDA requires every supplier to make this determination in the first instance, but the FDA may review any supplier's decision. The FDA may not agree with our decisions regarding whether new submissions or approvals are necessary. Our products could be subject to recall if the FDA determines, for any reason, that our products are not safe or effective or that appropriate regulatory submissions were not made. If new regulatory approvals are required, this could delay or preclude our ability to market the modified system. For example, due to the obsolescence of certain parts, we redesigned the illuminators used in the platelet and plasma systems. Further, certain plastics used to make INTERCEPT disposable kits are no longer available. We have received CE Mark and FDA approval for our platelet product using the alternate plastics and have recently received CE Mark approval for our plasma product using the alternate plastics, but we still need to qualify, validate and obtain approval for those plastics for our plasma product from the FDA and in any other jurisdictions that require local regulatory approval before we can utilize them in worldwide commercial manufacturing. In addition, in order to address the entire market in the U.S., we will need to obtain approval for additional configurations of the platelet system, including triple dose collections and random donor platelets. Our approved labels from the FDA limit our current approvals to certain platelet collection platforms and a particular storage solution for the particular collection platform. For instance, our approved claims permit apheresis collection of platelets on the Fresenius Amicus device while stored in an additive solution or for apheresis collection of platelets collected on the Terumo Trima device and stored in 100% plasma. Such discrepant collection methodologies and storage solutions and conditions also exist for red blood cells. We may be required to provide the FDA with data for each permutation for which blood banking treatment practices exist which may be time consuming, costly and limit the potential size of the U.S. market that can use our products. We have conducted and may conduct additional *in vitro* studies for our platelet system to potentially expand our label claims to include, among others, platelets collected from pooled random donors, storage of INTERCEPT-treated platelets for up to seven days rather than five days, and a new processing set for triple dose collections. Our failure to obtain FDA and foreign regulatory approvals of new platelet and plasma product configurations could significantly limit product revenues from sales of the platelet and plasma systems. In any event, delays in receipt or failure to receive approvals, the loss of previously received approvals, or the failure to comply with any other existing or future regulatory requirements, could reduce our sales and negatively impact our profitability potential and future growth prospects. In addition, if the FDA or other regulatory or accrediting body were to mandate safety interventions, including the option of pathogen reduction technology, when we had not received approval for all operational configurations, the market to which we could sell our products may be limited until we obtain such approvals, if ever, or may be permanently impaired if competing options are more broadly available. In addition, we may seek to expand use of our products under new PMA approvals or PMA supplements. For instance, we plan to perform *in vitro* studies and seek a PMA supplement to use our plasma system to produce extended storage cryoprecipitate and possibly for other plasma-derived biological plasma products. Even if we were to receive approval for a PMA supplement for extended storage cryoprecipitate, we may not receive label claims for all indications or for indications with the highest unmet need or market acceptance. The market dynamics may require or we may choose to pursue a change in business model whereby we are selling the finished component to hospitals rather than an illuminator and disposable kit to blood centers. While we are working on implementing the infrastructure we believe will be necessary to market an approved extended-storage cryoprecipitate product directly to hospitals subsequent to potential regulatory approval of any PMA supplement that we may propose to submit to the FDA, we have no experience selling to hospitals nor do we have experience or expertise complying with regulations governing finished biologics. If we are unable to successfully market such products to hospitals or comply with unique regulations, our ability to monetize and deliver such products will be negatively impacted.

We operate a complex global commercial organization, with limited experience in many countries, including the U.S. We have limited resources and experience complying with regulatory, legal, tax and political complexities as we expand into new and increasingly broad geographies.

We are responsible for worldwide sales, marketing, distribution, maintenance and regulatory support of the INTERCEPT Blood System. If we fail in our efforts to develop or maintain such internal competencies or establish acceptable relationships with third parties to support us in these areas on a timely basis, our ability to commercialize the INTERCEPT Blood System may be irreparably harmed.

We have a wholly-owned subsidiary, headquartered in the Netherlands, dedicated primarily to selling and marketing the platelet and plasma systems in Europe, the CIS and the Middle East. Our commercial activities for the U.S., Latin and South America and Asia are based out of our headquarters in Concord, California with certain support from our European headquarters in the Netherlands, with certain individuals servicing Latin and South America and Asia, domiciled outside of the U.S. Our commercial organization focused on the U.S. market has limited resources and is relatively inexperienced, and as a result, has limited to no experience selling and marketing our platelet and plasma systems. Given the large relative size of the American Red Cross, should they deploy INTERCEPT rapidly under our commercial agreement, our resources may be inadequate to fulfill the American Red Cross' and other customers' demands, which could result in a loss of product revenues or customer contracts, or both. We will need to maintain and may need to increase our competence and size in a number of functions, including sales, deployment and product support, marketing, regulatory, inventory and logistics, customer service, credit and collections, risk management, and quality assurance systems in order to successfully support our commercialization activities in all of the jurisdictions we currently sell and market, or anticipate selling and marketing, our products. Many of these competencies require compliance with U.S., E.U., South American, Asian and local standards and practices, including regulatory, legal and tax requirements, some of which we have limited experience. In this regard, should we obtain regulatory approval in an increased number of geographies, we will need to ensure that we maintain a sufficient number of personnel or develop new business processes to ensure ongoing compliance with the multitude of regulatory requirements in those territories. Hiring, training and retaining new personnel is costly, time consuming and distracting to existing employees and management. We have limited experience operating on a global scale and we may be unsuccessful complying with the variety and complexity of laws and regulations in a timely manner, if at all. In addition, in some cases, the cost of obtaining approval and maintaining compliance with certain regulations and laws may exceed the product revenue that we recognize from such a territory, which would adversely affect our results of operations and could adversely affect our financial condition. Furthermore, we may choose to seek alternative ways to sell or treat blood components with our products. These may include new business models, which may include selling kits to blood centers, performing inactivation ourselves, staffing blood centers or selling services or other business model changes. We have no experience with these types of business models, or the regulatory requirements or licenses needed to pursue such new business models. Additionally, such business models may be viewed as a threat to existing customers. We cannot assure you that we will pursue such business models or if we do, that we will be successful or that our existing customers will not feel threatened.

Further, in June 2016, the U.K. held a referendum in which voters approved an exit from the E.U., commonly referred to as "Brexit," and the U.K. government delivered a notice of withdrawal in March 2017, with the U.K. scheduled to exit the E.U. by October 2019. The withdrawal could, among other outcomes, disrupt the free movement of goods, services and people between the U.K. and the E.U., undermine bilateral cooperation in key policy areas and significantly disrupt trade between the U.K. and the E.U. We may also face new regulatory costs and challenges as a result of Brexit that could have a material adverse effect on our operations. In addition, Brexit could lead to legal uncertainty and potentially divergent national laws and regulations as the U.K. determines which E.U. laws to replace or replicate. Altered regulations could add time and expense to the process by which our product candidates receive regulatory approval in the E.U. Given the lack of comparable precedent, it is unclear what financial, regulatory, trade and legal implications the withdrawal of the U.K. from the E.U. will have and how such withdrawal will affect us.

We rely on third parties to market, sell, distribute and maintain our products and to maintain customer relationships in certain countries.

We have entered into distribution agreements, generally on a geographically exclusive basis, with distributors in certain regions. We rely on these distributors to obtain and maintain any necessary in-country regulatory approvals, as well as market and sell the INTERCEPT Blood System, provide customer and technical product support, maintain inventories, and adhere to our quality system in all material respects, among other activities. Generally, our distribution agreements require distributors to purchase minimum quantities in a given year over the term of the agreement. Failure by our distributors to meet these minimum purchase obligations may impact our financial results. In addition, failure by our distributors to provide an accurate forecast impacts our ability to predict the timing of product revenue and our ability to accurately forecast our product supply needs. While our contracts generally require distributors to exercise diligence, these distributors may fail to commercialize the INTERCEPT Blood System in their respective territories. For example, our distributors may fail to sell product inventory they have purchased from us to end customers or may sell competing products ahead of or in conjunction with INTERCEPT. In addition, initial purchases of illuminators or INTERCEPT disposable kits by these third parties may not lead to follow-on purchases of platelet and plasma systems' disposable kits. Agreements with our distributors typically require the distributor to maintain quality standards that are compliant with standards generally accepted

for medical devices. We may be unable to ensure that our distributors are compliant with such standards. Further, we have limited visibility into the identity and requirements of blood banking customers these distributors may have. Accordingly, we may be unable to ensure our distributors properly maintain illuminators sold or provide quality technical services to the blood banking customers to which they sell. In addition, although our agreements with our distributors generally require compliance with local anti-corruption laws, the U.S. Foreign Corrupt Practices Act, and other local and international regulations, we have limited ability to control the actions of our distributors to ensure they are in compliance. Noncompliance by a distributor could expose us to civil or criminal liability, fines and/or prohibitions on selling our products in certain countries.

Currently, a fairly concentrated number of distributors make up a significant portion of our product revenue and we may have little recourse, short of termination, in the event that a distributor fails to execute according to our expectations and contractual provisions. In the past, we have experienced weaker than expected growth due to declining performance by certain of our distributors. Periodically, we transition certain territories to new distribution partners or our direct sales force where we believe we can improve performance relative to the distributor. Because new distribution partners or our direct sales force may have limited experience marketing and selling our products in certain territories, or at all, we cannot be certain that they will perform better than the predecessor distributor. In certain cases, our distributors hold the regulatory approval to sell INTERCEPT for their particular geography. Termination, loss of exclusivity or transitioning from these distributors may require us to negotiate a transfer of the applicable regulatory approvals to us or new distributors which may be difficult to do in a timely manner, or at all. We expect that our product revenue will be adversely impacted with the loss or transition of one or more of these distributors. If we choose to terminate distributor agreements, we would either need to reach agreement with, qualify, train and supply a replacement distributor or supply and service end-user customer accounts in those territories ourselves. Although our distribution agreements generally provide that the distributor will promptly and efficiently transfer its existing customer agreements to us, there can be no assurance that this will happen in a timely manner or at all or that the distributor will honor its outstanding commitments to us. In addition, terminated distributors may own illuminators placed at customer sites and may require us to repurchase those devices or require end-user customers to purchase new devices from us. Additionally, we may need terminated distributors to cooperate with us or a new distributor in transitioning sub-distributor relationships and contracts, hospital contracts, public tenders, or regulatory certificates or licenses held in their name. These factors may be disruptive for our customers and our reputation may be damaged as a result. Our distribution partners may have more established relationships with potential end user customers than a new distributor or we may have in particular territory, which could adversely impact our ability to successfully commercialize our products in these territories. In addition, it may take longer for us to be paid if payment timing and terms in these new arrangements are less favorable to us than those in our existing distributor arrangements. As we service end-user accounts directly rather than through distributors, we incur additional expense, our working capital is negatively impacted due to longer periods from cash collection from direct sales customers when compared to the timing of cash collection from our former distribution partners and we may be exposed to additional complexity including local statutory and tax compliance. Current or transitioning distributors may irreparably harm relationships with local existing and prospective customers and our standing with the blood banking community in general. In the event that we are unable to find alternative distributors or mobilize our own sales efforts in the territories in which a particular distributor operates, customer supply, our reputation and our operating results may be adversely affected. In addition, in territories where new distributors are responsible for servicing end-user accounts, there will be a period of transition in order to properly qualify and train these new distributors, which may disrupt the operations of our customers and adversely impact our reputation and operating results.

Our products are a novel technology in the U.S. and blood centers and clinicians have little to no experience with pathogen reduction systems. Further, we have no prior experience commercializing products in the U.S. We may be unable to develop and maintain an effective and qualified U.S. based commercial organization or educate blood centers, clinicians and hospital personnel. As a result, we may not be able to successfully educate the market on the value of pathogen reduction or commercialize our products in the U.S.

Our ability to generate significant product revenue from our platelet and plasma systems depends in part on our ability to achieve market acceptance of, and to otherwise effectively market, our platelet and plasma systems in the U.S. Even if we are able to achieve market acceptance in the U.S. or newly commercialized markets, we have provided and may continue to provide adoption incentives which may negatively impact our reported sales. Successfully commercializing our products in the U.S. may take considerable time during which we will need to build relationships, additional routine-use data and trust from the industry. As a company, we have no prior experience in commercializing any products in the U.S., and we still need to attract, retain, train and support sales, marketing and scientific and hospital affairs personnel and other commercial talent. For example, we need to attract and retain hospital affairs professionals to help educate hospitals and physicians on our products, clinical trial history and publications. Hospital affairs professionals are highly educated and trained professionals and the hiring and employment market for hospital affairs professionals is highly competitive. As such, we need to commit significant additional management and other resources in order to maintain and expand our hospital affairs team and sales and marketing functions. We may be unable to develop and maintain adequate hospital affairs, sales and marketing capabilities for the U.S. market and we also may not be able to devote sufficient resources to the advertising, promotion and sales efforts for the platelet and plasma systems in the U.S. We will also have to compete with other life sciences and medical device companies to recruit, hire, train and retain the hospital affairs, sales and marketing personnel that we anticipate we need. For these and other reasons, we may be unable to develop and maintain an effective and qualified U.S.-based

commercial organization in a cost-effective manner or realize a positive return on our investment. If we are unable to develop and maintain an effective and qualified U.S.-based commercial organization in a timely manner or at all, we may fail to realize the full sales potential of our platelet and plasma systems in the U.S. In addition, should we seek and obtain approval for unique biological products created by use of the INTERCEPT blood system, including extended storage cryoprecipitate, we may choose to sell the treated end product directly to hospitals using our commercial organization. While we are working on implementing the infrastructure we believe will be necessary to market an approved extended-storage cryoprecipitate product directly to hospitals subsequent to potential regulatory approval of any PMA supplement that we may propose to submit to the FDA, we have no experience selling biological end products directly to hospitals which may cause a distraction for our commercial organization or we may be viewed as a competitive threat to our blood center customers. Even if we were to receive approval for a PMA supplement for extended-storage cryoprecipitate, we may not receive label claims for all indications or for indications with the highest unmet need or market acceptance.

Our manufacturing supply chain exposes us to significant risks.

We do not own our own manufacturing facilities, but rather manufacture our products using a number of third party suppliers, many of whom are our sole suppliers for the particular product or component that we procure. We rely on various contracts and our relationships with these suppliers to ensure that the sourced products are manufactured in sufficient quantities, timely, to our exact specifications and at prices we agree upon with the supplier. The price that we pay to some of our suppliers is dependent on the volume of products or components that we order. If we are unable to meet the volume tiers that afford the most favorable pricing, our gross margins will be negatively impacted.

In October 2015, we amended and restated our manufacturing and supply agreement with Fresenius. Under the amended agreement, Fresenius is obligated to sell, and we are obligated to purchase finished disposable kits for the platelet, plasma and red blood cell kits from Fresenius with certain exceptions permitted. The initial term of the amended agreement extends through July 1, 2025, and is automatically renewed thereafter for additional two-year renewal terms, subject to termination by either party upon (i) two years written notice prior to the expiration of the initial term or (ii) one year written notice prior to the expiration of any renewal term. We and Fresenius each have normal and customary termination rights, including termination for material breach. Fresenius is our sole supplier for the manufacture of these products. Fresenius may fail to manufacture an adequate supply of INTERCEPT disposable kits which would harm our business. Disruptions to our supply chain as a result of any potential ensuing protests, strikes or other work-stoppages would be detrimental to our business and operating results. In the event Fresenius refuses or is unable to continue operating under the agreement, we may be unable to maintain inventory levels or otherwise meet customer demand, and our business and operating results would be materially and adversely affected.

We also have contracts with other third-party suppliers, including Ash Stevens for the manufacture of amotosalen, our proprietary compound for reducing pathogens that is used in our platelet and plasma systems; Purolite, and separately, Porex, for the manufacture of components of the compound adsorption devices used in our platelet and plasma systems; and Nova for the manufacture of illuminators and certain components of the INTERCEPT Blood System. These independent suppliers are currently our sole qualified suppliers for such components and products.

Our manufacturing and supply agreement with Ash Stevens automatically extended at the end of 2017 and now continues until December 31, 2019, and will continue to automatically renew thereafter for periods of two years each, but may be terminated by Ash Stevens provided that Ash Stevens notifies us in writing at least two years in advance. We have not been notified by Ash Stevens of their intention to terminate the agreement. Although we are not subject to minimum annual purchase requirements under the manufacturing and supply agreement with Ash Stevens, we may be required to pay a maintenance fee of up to \$50,000 a year if specified quantities of amotosalen are not purchased in any year. We have incurred these maintenance fees in the past and may incur these maintenance fees in future periods.

In April 2017, we entered into an amended and restated manufacturing and supply agreement with Porex for the continued supply of the compound adsorption devices. Porex is our sole supplier for certain components of and manufacturing of the compound adsorption devices. Under the amended and restated Porex agreement, we are no longer subject to a minimum annual purchase requirement; however, Porex has the right to terminate the agreement, upon twelve months' prior written notice, if annual production falls below a mutually agreed threshold. If not sooner terminated, the amended and restated Porex agreement expires on December 31, 2019. In addition, we entered into an amended and restated supply agreement with Brotech Corporation d/b/a Purolite Company, or Purolite, for the supply of raw materials used to make the compound adsorption devices. The amended supply agreement expires in April 2021 and will automatically renew for an additional year unless either party has provided notice not to renew at least two years prior to the expiration. Under the terms of the amended agreement, pricing is volume based and is subject to annual, prospective adjustments based on a Producer Price Index subject to an annual cap. Our agreement with Nova, which manufactures our illuminators, currently extends through September 2019 and is automatically renewable for one year terms, but may be terminated by Nova on at least twelve months' prior written notice. We have not been notified by Nova of their intention to terminate the agreement.

Facilities at which the INTERCEPT Blood System or its components are manufactured may cease operations for planned or unplanned reasons or may unilaterally change the formulations of certain commercially available reagents that we use, causing at least temporary interruptions in supply. In addition, given our recent rapid growth and potential for continued or even accelerated growth, we may need to identify, validate and qualify additional manufacturing capacity with existing or new suppliers. Further, customer demand for our platelet kits may fully utilize the production capacity of our third party manufacturer (s), as a result we may need to allocate manufacturing resources such that our supply of platelet kits or plasma kits could be adversely impacted. Even a temporary failure to supply adequate numbers of INTERCEPT Blood System components may cause an irreparable loss of customer goodwill and potentially irreversible loss of momentum in the marketplace. Although we are actively evaluating alternate suppliers for certain components, we do not have qualified suppliers or capacity beyond those on which we currently rely, and we understand that Fresenius relies substantially on sole suppliers of certain materials for our products. In addition, suppliers from whom our contract manufacturers source components and raw materials may cease production or supply of those components to our contract manufacturers. For example, certain plastics used to make INTERCEPT disposable kits are no longer available. As a result, we and our manufacturers have identified alternate plastics and we have received CE Mark and FDA approval for our platelet product using the alternate plastics and have recently received CE Mark approval for our plasma product using the alternate plastics, but we still need to qualify, validate and obtain approval from the FDA and from any other jurisdictions that require local regulatory approval for those plastics for our plasma product before we can utilize them in worldwide commercial manufacturing. In addition, we understand that a compound adsorbent housing component is no longer available and an alternate housing will need to be qualified by Fresenius. Identification and qualification of alternate suppliers is time consuming and costly, and there can be no assurance that we will be able to demonstrate equivalency of alternate components or suppliers or that we will receive regulatory approval in the U.S. or other jurisdictions. If we conclude that supply of the INTERCEPT Blood System or components from suppliers is uncertain, we may choose to build and maintain inventories of raw materials, work-in-process components, or finished goods, which would consume capital resources faster than we anticipate and may cause our supply chain to be less efficient.

Currently Nova is manufacturing illuminators to meet customer demand and maintain our own inventory levels. Subject to obsolescence, we may be required to identify and qualify replacement components for illuminators and in doing so, we may be required to conduct additional studies, which could include clinical trials to demonstrate equivalency or validate any required design or component changes. We and our customers rely on the availability of spare parts to ensure that customer platelet and plasma production is not interrupted. If we are not able to supply spare parts for the maintenance of customer illuminators, our ability to keep existing customers, increase production for existing customers or sign up new customers may be negatively impacted. Due to the obsolescence of certain parts, we have redesigned or will have to redesign the illuminators used in the platelet and plasma systems, and we will need to receive approval of these changes from the FDA. Our failure to obtain FDA and foreign regulatory approvals of a new illuminator could constrain our ability to penetrate the U.S. market and may otherwise significantly limit product revenue from sales of the platelet and plasma systems. In any event, delays in receipt or failure to receive these approvals could reduce our sales and negatively impact our profitability potential and future growth prospects. Furthermore, we understand that components used in the redesigned illuminator are no longer commercially available beyond what we and Nova have stockpiled or to which we have access under final buy transactions or may become unavailable in the current specifications in the near-term. As with our disposable sets, if we conclude that supply of components or spare parts for the illuminators is uncertain, we may choose to purchase and maintain inventories of such components or spare parts, which would consume capital resources faster than we anticipate and may cause our supply chain to be less efficient. We will need to continue investing in subsequent versions of the illuminator to enhance functionality and manage obsolescence. In addition, our illuminators contain embedded proprietary software that runs on software code we have developed and that we own. Changes to certain components due to obsolescence, illuminator redesign or market demand, may require us to modify the existing software code or to develop new illuminator software. Our ability to develop new illuminator software, correct coding flaws and generally maintain the software code is reliant on third-party contractors who, in some cases, have sole knowledge of the software code. Our ability to develop and maintain the illuminator software may be impaired if we are not able to continue contracting with those key third-party contracted developers or if we are unable to source alternate employees or consultants to do so. Software development is inherently risky and may be time consuming and costly.

In the event that alternate manufacturers are identified and qualified, we will need to transfer know-how relevant to the manufacture of the INTERCEPT Blood System to such alternate manufacturers; however, certain of our supplier's materials, manufacturing processes and methods are proprietary to them, which will impair our ability to establish alternate sources of supply, even if we are required to do so as a condition of regulatory approval. We may be unable to establish alternate suppliers without having to redesign certain elements of the platelet and plasma systems. Such redesign may be costly, time consuming and require further regulatory review and approvals. We may be unable to identify, select, and qualify such manufacturers or those third parties able to provide support for development and testing activities on a timely basis or enter into contracts with them on reasonable terms, if at all. Moreover, the inclusion of components manufactured by new suppliers could require us to seek new or updated approvals from regulatory authorities, which could result in delays in product delivery. We may not receive any such required regulatory approvals. We cannot assure you that any amendments to existing manufacturing agreements or any new manufacturing agreements that we may enter into will contain terms more favorable to us than those that we currently have with our manufacturers. Many of the existing agreements we have with suppliers contain provisions that we have been operating under for an extended period of time, including pricing. Should we enter into agreements or amend agreements with any manufacturer with less favorable terms, including pricing, our results of operations may be impacted, our recourse against such manufacturers may be limited, and the quality of our products may be impacted.

Raw materials, components or finished product may not meet specifications or may be subject to other nonconformities. In the past, non-conformities in certain component lots have caused delays in manufacturing of INTERCEPT disposable kits. Similarly, we have experienced non-conformities and out of specification results in certain component manufacturing needed for clinical use, commercial sale and regulatory submissions. Non-conformities can increase our expenses and reduce gross margins or result in delayed regulatory submissions or clinical trials. Should non-conformities occur in the future, we may be unable to manufacture products to support our red blood cell clinical trials, or to meet customer demand for our commercial products, which would result in delays for our clinical programs, or lost sales for our commercial products, and could cause irreparable damage to our customer relationships. Later discovery of problems with a product, manufacturer or facility may result in additional restrictions on the product, manufacturer or facility, including withdrawal of the product from the market. We are subject to risks and costs of product recall, which include not only potential out-of-pocket costs, but also potential interruption to our supply chain. In such an event, our customer relations could be harmed and we would incur unforeseen losses. For example, in April 2018, we instituted a voluntary recall in the E.U. of a specified lot of our disposable platelet kits after identifying the possibility of an incomplete seal where the tubing meets the base of the sampling pouch, which is used to obtain a sample of the INTERCEPT - treated platelets. While we do not believe this recall to date has affected patient safety in any way, our reputation with customers may be negatively impacted and regulators may require additional measures to ensure quality controls are adequate.

In the event of a failure by Fresenius or other manufacturers to perform their obligations to supply components of the INTERCEPT Blood System to us, damages recoverable by us may be insufficient to compensate us for the full loss of business opportunity. Many of our supply agreements contain limitations on incidental and consequential damages that we may recover. A supplier's potential liability in the event of non-performance may not be sufficient to compel the supplier to continue to act in conformity with our agreements. Our product supply chain requires us to purchase certain components in minimum quantities and may result in a production cycle of more than one year. Significant disruptions to any of the steps in our supply chain process may result in longer production cycles which could lead to inefficient use of cash or may impair our ability to supply customers with product.

We may encounter unforeseen manufacturing difficulties which, at a minimum, may lead to higher than anticipated costs, scrap rates, or delays in manufacturing products. In addition, we may not receive timely or accurate demand information from distributors or customers, or may not accurately forecast demand ourselves for the INTERCEPT Blood System. Should actual demand for our products exceed our own forecasts or forecasts that customers provide, we may be unable to fulfill such orders timely, if at all. Should we be unable to fulfill demand, particularly if mandated by a public health authority, our reputation and business prospects may be impaired. Further, certain distributors and customers require, and potential future distributors or customers may require, product with a minimum shelf life. If customers requiring minimum shelf-lives order smaller quantities or do not purchase product as we anticipate, or at all, we may have elevated inventory levels with relatively short shelf-lives which may lead to increased write-offs and inefficient use of our cash. Should we choose not to fulfill smaller orders with minimum shelf lives, our product sales may be harmed. We will need to destroy or consume outdated inventory in product demonstration activities, which may in turn lead to elevated product demonstration costs and/or reduced gross margins. In order to meet minimum shelf-life requirements, we may need to manufacture sufficient product to meet estimated forecasted demand. As a result, we may carry excess work-in-process or finished goods inventory, which would consume capital resources and may become obsolete, or our inventory may be inadequate to meet customer demand. Our platelet and plasma systems' disposable kits have 18 to 24 months shelf lives from the date of manufacture. Should we change or modify any of our product configurations or components, such future configurations of our products may not achieve the same shelf life that existing products have. We and our distributors may be unable to ship product to customers prior to the expiration of the product shelf life, a risk that is heightened if we elect to increase our inventory levels in order to mitigate supply disruptions. We have entered into certain public tenders, some of which call for us to maintain certain minimum levels of inventory. If our suppliers fail to produce components or our finished products satisfactorily, timely, at acceptable costs, and in sufficient quantities, we may incur delays, shortfalls and additional expenses, or non-compliance with certain public tenders which may in turn result in penalty fees, permanent harm to our customer relations or loss of customers. In addition, certain large national customers, like those in France or the U.K. may choose to convert all of their operation to INTERCEPT. Should we or our suppliers encounter any manufacturing issues, we may not be able to satisfy all of the global demand or may have to allocate available product to certain customers which may negatively impact our customers operations and consequently, our reputation. Conversely, we may choose to overstock inventory in order to mitigate any unforeseen potential disruption to manufacturing which could consume our cash resources faster than we anticipate and may cause our supply chain to be less efficient. Additionally, should we conclude that existing suppliers are not able to produce sufficient quantities to meet the demand for our products, we may choose to invest in manufacturing capacity at existing or new facilities with existing or new suppliers, which could be costly and disruptive to our management.

Certain regions that we sell into or may sell into in the future may give priority to those products that are manufactured locally in their jurisdiction. Our failure to meet these local manufacturing conditions may prevent us from successfully commercializing our product in those geographies. In addition, should we choose to manufacture locally in those jurisdictions, we would likely incur additional costs, may be unable to meet our quality system requirements or successfully manufacture products, and such activities will be a distraction from our current focus and operations. We have no experience manufacturing or working with manufacturers outside of our current manufacturing footprint.

Obsolescence or shortage of raw materials, key components of and accessories to the INTERCEPT Blood System, may impact our ability to supply our customers, may negatively impact the operational costs of our customers and may increase the prices at which we sell our products, resulting in slower than anticipated growth or negative future financial performance.

The manufacture, supply and availability of key components of, and accessories to, our products are dependent upon a limited number of third parties and the commercial adoption and success of our products is dependent upon the continued availability of these components or accessories. For example, our customers rely on continued availability of third-party supplied plastics, saline and reagents for processing, storing and manufacturing blood components. If the blood product industry experiences shortages of these components or accessories, the availability and use of our products may be impaired.

With respect to the manufacture of our products, our third party manufacturers source components and raw materials for the manufacture of the INTERCEPT processing sets. Certain of these components are no longer commercially available, are nearing end-of-life or are available only from a limited number of suppliers. We and our third party manufacturers do not have guaranteed supply contracts with all of the raw material or component suppliers for our products, which magnify the risk of shortage and obsolescence and decreases our manufacturers' ability to negotiate pricing with their suppliers. For example, a solvent used in the manufacture of a raw material for our compound adsorption device is no longer available. Our contract manufacturer has produced a substantial amount of the raw material using its remaining inventory of the solvent as a last time purchase. However, the amount of material is finite and we and our contract manufacturer will need to qualify an alternate solvent used in the manufacture of the raw material. The raw material from this last time build has not consistently met our specifications after further processing into components. If we are unable to use all of the raw material produced during the final production run, or if the final material produces suboptimal results, we may need to seek changes to our platelet system operating parameters from regulators, require customers to modify their operating practices, or run out of material before an alternate material can be qualified. Should we be unsuccessful in any of these initiatives, we may be unable to provide customers with product to meet their production needs which may cause irreparable harm in the marketplace. Customers may object to changes in operating practices or changes to the instructions for use, and a potential negative impact on their operations as a result of the use of this material could impair our reputation or customer acceptance of our products. Any shortage or obsolescence of raw materials, components or accessories or our inability to control costs associated with raw materials, components or accessories, could increase our costs to manufacture our products. Further, if any supplier to our third party manufacturers is unwilling or unable to provide high quality raw materials in required quantities and at acceptable prices, our manufacturers may be unable to find alternative sources or may fail to find alternative suppliers at commercially acceptable prices, on satisfactory terms, in a timely manner, or at all. If any of these events were to occur, our product quality, competitive position, reputation and business could suffer, we could experience cancellations of customer orders, refusal by customers to accept deliveries or a reduction in our prices and margins to the detriment of our financial performance and results of operations.

We are subject to federal, state and foreign laws governing our business practices which, if violated, could result in substantial penalties and harm our reputation and business.

We are subject to a number of laws that affect our sales, marketing and other promotional activities by limiting the kinds of financial arrangements we may have with hospitals, physicians, healthcare providers or other potential purchasers of our products. These laws are often broadly written, and it is often difficult to determine precisely how these laws will be applied to specific circumstances. For example, within the E.U., the control of unlawful marketing activities is a matter of national law in each of the member states. The member states of the E.U. closely monitor perceived unlawful marketing activity by companies. We could face civil, criminal and administrative sanctions if any member state determines that we have breached our obligations under its national laws. Industry associations also closely monitor the activities of member companies. If these organizations or authorities name us as having breached our obligations under their regulations, rules or standards, our reputation would suffer and our business and financial condition could be adversely affected.

In addition, there are numerous U.S. federal, state and local healthcare regulatory laws, including, but not limited to, anti-kickback laws, false claims laws, privacy laws, and transparency laws. Our relationships with healthcare providers and entities, including but not limited to, hospitals, physicians, healthcare providers and our customers are subject to scrutiny under these laws. Violations of these laws can subject us to penalties, including, but not limited to, administrative, civil and criminal penalties, damages, fines, disgorgement, imprisonment, exclusion from participation in federal and state healthcare programs, including the Medicare and Medicaid programs, additional reporting requirements and/or oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and the curtailment of our operations. Healthcare fraud and abuse regulations are complex, and even minor irregularities can potentially give rise to claims that a statute or prohibition has been violated. The laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully offering, paying, soliciting, or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, in exchange for or to induce, the referral of an individual for, 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 federal healthcare programs such as Medicare and Medicaid;
- federal false claims laws, including the federal False Claims Act, that prohibit, among other things, knowingly presenting, or causing to be presented, claims for payment or approval from Medicare, Medicaid or other federal payors that are false or fraudulent, or knowingly making a false statement to improperly avoid, decrease or conceal an obligation to pay money to the federal government, and which may apply to entities that provide coding and billing advice to customers;
- the civil monetary penalties statute, which imposes penalties against any person or entity who, among other things, is determined to have presented or caused to be presented, a claim to a federal healthcare program that the person knows, or should know, is for an item or service that was not provided as claimed or is false or fraudulent;
- the federal Health Insurance Portability and Accountability Act of 1996, as amended, or HIPAA, which created federal criminal laws that prohibit executing a scheme to defraud any healthcare benefit program, including private payors, or making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose requirements on certain covered healthcare providers, health plans and healthcare clearinghouses as well as their business associates that perform services for them that involve individually identifiable health information, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization, including mandatory contractual terms as well as directly applicable privacy and security standards and requirements;
- the federal transparency requirements under the Physician Payments Sunshine Act, enacted as part of the ACA, that require applicable manufacturers of covered drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program, with specific exceptions, to track and annually report to the Centers for Medicare & Medicaid Services, or CMS, payments and other transfers of value provided to physicians and teaching hospitals, and certain ownership and investment interests held by physicians or their immediate family members;
- the Federal Trade Commission Act and similar laws regulating advertisement and consumer protections; and
- foreign, or U.S. state or local law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers; U.S. state laws that require device companies to comply with the 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; U.S. state and local laws that require device manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and U.S. state laws governing the privacy and security of certain health information, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

We are also subject to foreign laws and regulations covering data privacy and the protection of health-related and other personal information. In this regard, E.U. member states and other foreign jurisdictions, including Switzerland, have adopted data protection laws and regulations which impose significant compliance obligations. Moreover, effective May 25, 2018, the collection and use of personal health data in the E.U. is governed by the provisions of the E.U. General Data Protection Regulation, or the GDPR. The GDPR, which is wide-ranging in scope, imposes several requirements relating to the control over personal data by individuals to whom the personal data relates, the information provided to the individuals, the documentation we must maintain, the security and confidentiality of the personal data, data breach notification and the use of third party processors in connection with the processing of personal data. The GDPR also imposes strict rules on the transfer of personal data out of the E.U., provides an enforcement authority and authorizes the imposition of large penalties for noncompliance, including the potential for fines of up to €20 million or 4% of the annual global revenues of the non-compliant company, whichever is greater. The GDPR requirements apply not only to third-party transactions, but also to transfers of information between us and our subsidiary, including employee information. The GDPR has

increased our responsibility and potential liability in relation to personal data that we process compared to prior E.U. law, including in clinical trials, and we may be required to put in place additional mechanisms to ensure compliance with the GDPR, which could divert management's attention and increase our cost of doing business. However, despite our ongoing efforts to bring our practices into compliance with the GDPR, we may not be successful either due to various factors within our control or other factors outside our control. It is also possible that local data protection authorities may have different interpretations of the GDPR, leading to potential inconsistencies amongst various E.U. member states. Any failure or alleged failure (including as a result of deficiencies in our policies, procedures or measures relating to privacy, data security, marketing or communications) by us to comply with laws, regulations, policies, legal or contractual obligations, industry standards or regulatory guidance relating to privacy or data security, may result in governmental investigations and enforcement actions, litigation, fines and penalties or adverse publicity. In addition, new regulation, legislative actions or changes in interpretation of existing laws or regulations regarding data privacy and security (together with applicable industry standards) may increase our costs of doing business. In this regard, we expect that there will continue to be new laws, regulations and industry standards relating to privacy and data protection in the United States, the E.U. and other jurisdictions, such as the California Consumer Privacy Act of 2018 that will go into effect beginning January 1, 2020, which has been characterized as the first "GDPR-like" privacy statute to be enacted in the U.S. because it mirrors a number of the key provisions in the GDPR, and we cannot determine the impact such new laws, regulations and standards may have on our business .

We are also subject to the U.S. Foreign Corrupt Practices Act and anti-corruption laws, and similar laws with a significant anti-corruption intent in foreign countries. In general, there is a worldwide trend to strengthen anticorruption laws and their enforcement. Any violation of these laws by us or our agents or distributors could create a substantial liability for us, subject our officers and directors to personal liability and also cause a loss of reputation in the market. We currently operate in many countries where the public sector is perceived as being more or highly corrupt. Our strategic business plans include expanding our business in regions and countries that are rated as higher risk for corruption activity, such as China, India and Russia. Becoming familiar with and implementing the infrastructure necessary to comply with laws, rules and regulations applicable to new business activities and mitigate and protect against corruption risks could be quite costly. In addition, failure by us or our agents or distributors to comply with these laws, rules and regulations could delay our expansion into high-growth markets, could damage market perception of our business and could adversely affect our existing business operations. Increased business in higher risk countries could also subject us and our officers and directors to increased scrutiny and increased liability.

Further, the United States Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA, among other things, amends the intent requirements of the federal Anti-Kickback Statute and certain criminal statutes governing healthcare fraud. A person or entity can now be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, the ACA provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal False Claims Act. Moreover, while we do not submit claims and our customers make the ultimate decision on how to submit claims, from time-to-time, we may provide reimbursement guidance to our customers. If a government authority were to conclude that we provided improper advice to our customers or encouraged the submission of false claims for reimbursement, we could face action against us by government authorities. Any violations of these laws, or any action against us for violation of these laws, even if we successfully defend against it, could result in a material adverse effect on our reputation, business, results of operations and financial condition.

Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available under such laws, it is possible that some of our business activities, including our relationships with healthcare providers and entities, including, but not limited to, hospitals, physicians, healthcare providers and our distributors, and certain sales and marketing practices, including the provision of certain items and services to our customers, could be subject to challenge under one or more of such laws.

To enforce compliance with the healthcare regulatory laws, federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. Responding to investigations can be time-and resource-consuming and can divert management's attention from the business. Additionally, as a result of these investigations, healthcare providers and entities may have to agree to additional onerous compliance and reporting requirements as part of a consent decree or corporate integrity agreement. Any such investigation or settlement could increase our costs or otherwise have an adverse effect on our business.

In addition, there has been a recent trend of increased U.S. federal, state and local regulation of payments and transfers of value provided to healthcare professionals or entities. Section 6002 of the ACA, known as the Physician Payments Sunshine Act, imposes annual reporting requirements on device manufacturers for payments and other transfers of value provided by them, directly or indirectly, to physicians and teaching hospitals, as well as ownership and investment interests held by physicians and their family members. A manufacturer's failure to submit timely, accurately and completely the required information for all payments, transfers of value or ownership or investment interests may result in significant civil monetary penalties. Manufacturers must submit reports to CMS by the 90th day of each subsequent calendar year. Due to the difficulty in complying with the Physician Payments Sunshine Act, we cannot assure you that we will successfully report all payments and transfers of value provided by us, and any failure to comply

could result in significant fines and penalties. Some states, such as California and Connecticut, also mandate implementation of commercial compliance programs, and other states, such as Massachusetts and Vermont, impose restrictions on device manufacturer marketing practices and tracking and reporting of gifts, compensation and other remuneration to healthcare professionals and entities. The shifting commercial compliance environment and the need to build and maintain robust and expandable systems to comply with different compliance and reporting requirements in multiple jurisdictions increase the possibility that we may fail to comply fully with one or more of these requirements.

Although compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, the risks cannot be entirely eliminated. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business.

Most of these laws apply to not only the actions taken by us, but also actions taken by our distributors or other third party agents. We have limited knowledge and control over the business practices of our distributors and agents, and we may face regulatory action against us as a result of their actions which could have a material adverse effect on our reputation, business, results of operations and financial condition.

In addition, the scope and enforcement of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. U.S. federal or state regulatory authorities might challenge our current or future activities under these laws. Any such challenge could have a material adverse effect on our reputation, business, results of operations and financial condition. Any U.S. federal or state or foreign regulatory review of us, regardless of the outcome, would be costly and time-consuming. Additionally, we cannot predict the impact of any changes in these laws, whether or not retroactive. Compliance with these and other changing regulations will increase our costs and may require increasing management attention.

Legislative, regulatory, or other healthcare reforms may make it more difficult and costly for us to obtain regulatory approval of our products and to produce, market and distribute our products after approval is obtained.

Regulatory guidance and regulations are often revised or reinterpreted by the regulatory agencies in ways that may significantly affect our business and our products. Any new regulations or revisions or reinterpretations of existing regulations may impose additional costs or lengthen review times of our products. Delays in receipt of, or failure to receive, regulatory approvals for our new products or product configurations would have a material adverse effect on our business, results of operations and financial condition.

Federal and state governments in the U.S. have recently enacted legislation to overhaul the nation's healthcare system. While the goal of healthcare reform is to expand coverage to more individuals, it also involves increased government price controls, additional regulatory mandates and other measures designed to constrain medical costs. The ACA significantly impacts the medical device industry. Among other things, the ACA:

- imposed an annual excise tax of 2.3% on entities that manufacture or import eligible medical devices offered for sale in the U.S.;
- established a Patient-Centered Outcomes Research Institute to oversee and identify priorities in comparative clinical effectiveness research in an effort to coordinate and develop such research; and
- implemented payment system reforms including a national pilot program on payment bundling to encourage hospitals, physicians and other providers to improve the coordination, quality and efficiency of certain healthcare services through bundled payment models.

Since its enactment, there have been judicial and Congressional challenges to numerous provisions of the ACA, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the ACA. Since January 2017, President Trump has signed two Executive Orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017, or the Tax Act, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate". On January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including delaying imposition of the medical device excise tax on non-exempt medical devices through December 31, 2019. In July 2018, CMS published a final rule permitting further collections and payments to and from certain ACA-qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. On December 14, 2018, a Texas U.S. District Court Judge ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Act. While the Texas U.S. District Court Judge, as well as the Trump administration and CMS, have stated that the ruling will have no immediate effect pending appeal of the decision, it is unclear how

this decision, subsequent appeals, and other efforts to repeal and replace the ACA will impact the ACA and our business. Any repeal and replace legislation may have the effect of limiting the amounts that government agencies will pay for healthcare products and services, which could result in reduced demand for our products or additional pricing pressure, or may lead to significant deregulation, which could make the introduction of competing products and technologies much easier. Policy changes, including potential modification or repeal of all or parts of the ACA or the implementation of new health care legislation could result in significant changes to the health care system, which could have a material adverse effect on our business, results of operations and financial condition.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 2, 2011, President Obama signed into law the Budget Control Act of 2011, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals in spending reductions. The Joint Select Committee did not achieve a targeted deficit reduction of at least \$1.2 trillion for the years 2013 through 2021, triggering the legislation's automatic reduction to several government programs. This includes reductions to Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013 and, due to subsequent legislative amendments to the statute, including the Bipartisan Budget Act of 2018, will stay in effect through 2027, unless additional congressional action is taken. On January 2, 2013, President Obama signed into law the American Taxpayer Relief Act of 2012 which, among other things, further reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. More recently, there has been heightened governmental scrutiny in the United States to control the rising cost of healthcare. For example, such scrutiny has resulted in several recent congressional inquiries and federal and state legislative activity designed to, among other things, bring more transparency to pricing and reform government program reimbursement methodologies for pharmaceutical products, some of which are included in the Trump administration's "Blueprint to Lower Drug Prices and Reduce Out-of-Pocket Costs" released in May 2018. State legislatures are also increasingly passing legislation and implementing regulations designed to control the cost of healthcare, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures.

The Trump administration has publicly stated a core goal is to deregulate wherever possible. It is unclear if this contraction in regulation would also apply to previously issued guidance documents that would impact our industry. For example, the FDA has indicated that they will finalize guidance prescribing steps blood centers would have to comply with to safeguard platelet products from bacterial contamination. The initial draft guidance prescribed our technology as an option. Should the administration remove such guidance documentation, market uptake for INTERCEPT platelets may be impaired. Conversely, any significant deregulation could make the introduction of competing products and technologies much easier than the burden faced by us in order to receive FDA approval. We expect that additional U.S. federal and state and foreign healthcare reform measures will be adopted in the future, any of which could limit the amounts that governments will pay for healthcare products and services, which could result in reduced demand for our products or additional pricing pressure.

Our platelet and plasma products and product candidates are not compatible with some collection, production and storage methods or combinations thereof. Further, blood centers using INTERCEPT must have access to those certain devices, blood bags, assays or platelet additive solutions that are compatible with our products.

The equipment and materials used to collect platelets vary by manufacturer and by geographic region. Platelets may be collected from a single donor by apheresis using an automated collection machine. Apheresis devices currently used in the U.S. and European markets differ, among other characteristics, in their ability to collect platelets in reduced volumes of plasma. Platelet collection device manufacturers may need to modify device collection parameters or software before a prospective customer could use INTERCEPT. If these manufacturers are not cooperative or are resistant to assist their customers or do not assist with making such modifications, the potential market for our products may be limited. Platelet concentrates may also be prepared from whole blood by pooling together platelets from multiple donors. There are two commonly used methods for preparing whole blood platelets: the buffy coat method, which is used extensively in Europe, and the pooled random donor method, which is used in the U.S. Our platelet system is designed to work with platelets collected and stored in storage solutions, called InterSol and SSP+, and for platelets suspended in 100% plasma. Fresenius is the exclusive manufacturer of InterSol and MacoPharma of SSP+, both widely-used PASs. Many of our customers and prospective customers use InterSol or SSP+ in connection with INTERCEPT treatment. Similarly, some of our customers combine multiple platelet or plasma components before treating the combined product with INTERCEPT. There are several third party manufacturers of pooling sets to allow for such combination. Our customers' ability to use our INTERCEPT products may be impaired should manufacturers of those products not provide access to their products allowing for the combination of multiple components or if such manufacturers experience a shortage of their products. Should manufacturers of collection devices, compatible assays and blood bags, pooling sets or platelet additive solutions fail to obtain or maintain regulatory approval, experience unexpected production disruption, or decide to cease distribution of those respective products to customers and prospective customers, our ability to sell the INTERCEPT Blood System may be impaired and acceptance in the marketplace could be harmed.

In order to address the entire market in the U.S., Japan, and potentially elsewhere, we will need to develop and test additional configurations of the platelet system. For example, in the U.S., we understand a significant number of platelet concentrates are derived from larger volumes collected from apheresis donors split into three therapeutic transfusable doses. Future configurations of the platelet system will be needed to treat platelet donations with such processing parameters. We estimate that the majority of platelets used in the U.S. are collected by apheresis, though a significant minority is prepared from pooled random donor platelets derived from whole blood collections. In addition, many blood centers may view pooled random donor platelets treated with INTERCEPT as an economically optimal approach. In order to gain regulatory approvals for a pathogen reduction system compatible with triple dose collections, and random donor platelets, we will need to perform additional product development and testing, including additional clinical trials. We have conducted and may conduct additional *in vitro* studies for our platelet system to potentially expand our label claims to include, among others, platelets collected from pooled random donors, storage of INTERCEPT-treated platelets for up to seven days rather than five days, and a new processing set for triple dose collections. In the U.S., our approved labels for the platelet system from the FDA limit our current approvals to certain platelet collection platforms and a particular storage solution for the particular collection platform. For instance, our approved claims permit apheresis collection of platelets on the Fresenius Amicus device while stored in an additive solution or for apheresis collection of platelets collected on the Terumo Trima device and stored in 100% plasma. We may be required to provide the FDA with data for each permutation for which blood banking treatment practices exist which may be time consuming, costly and limit the potential size of the U.S. market that can use our products. Our failure to obtain FDA and foreign regulatory approvals of any new configurations could significantly limit product revenue from sales of the platelet system. In addition, given that there is some loss of platelets using our product, blood centers may need to increase collection volumes in order to use our product and maintain an adequate concentration for a triple therapeutic dose. In any event, delays in receipt or failure to receive approval could reduce our sales and negatively impact our profitability potential and future growth prospects. Similarly, to achieve market acceptance in certain geographies, we may be required to design, develop and test new product configurations for the platelet and plasma systems. In addition, if the FDA or other regulatory or accrediting body were to mandate safety interventions, including the option of pathogen reduction technology, when we had not received approval for all operational configurations, the market to which we could sell our products may be limited until we obtain such approvals, if ever, or may be permanently impaired if competing options are more broadly available. In addition, we will need to continue to generate acceptable data in order to conform with the evolving collection practices such as automated whole-blood collection. If we are unable to conform to evolving collection practices our ability to address those portions of the market may be compromised. These development activities will increase our costs significantly and may not be successful. We may need to demonstrate the safety and efficacy of our platelet system using a variety of configurations before our platelet system would be approved for such configurations. Delays in obtaining any future approvals would adversely affect our ability to introduce new or enhanced products in a timely manner, which in turn would harm our product revenue and potential future profitability.

If our competitors develop products superior to ours, market their products more effectively than we market our products, or receive regulatory approval before our products, our commercial opportunities could be reduced or eliminated.

We expect our products will continue to encounter significant competition. The INTERCEPT Blood System products compete with other approaches to blood safety currently in use and may compete with future products that may be developed by others. Our success will depend in part on our ability to respond quickly to customer and prospective customer needs, successfully receive and maintain regulatory approvals, and adapt to medical and technological changes brought about by the development and introduction of new products. Competitors' products or technologies may make our products obsolete or non-competitive before we are able to generate any significant product revenue. In addition, competitors or potential competitors may have substantially greater financial and other resources than we have. They may also have greater experience in preclinical testing, human clinical trials and other regulatory approval procedures. If competitors' products experience significant problems, customers and potential customers may question the safety and efficacy of all pathogen reduction technologies, including the INTERCEPT Blood System. Such questions and concerns may impair our ability to market and sell the INTERCEPT Blood System.

Several companies have, or are developing, technologies that are, or in the future may be, the basis for products that will directly compete with or reduce the market for our pathogen reduction systems. A number of companies are specifically focusing on alternative strategies for pathogen reduction in platelets and plasma.

These alternative strategies may be more effective in reducing certain types of pathogens from blood products, including certain non-lipid-enveloped viruses, such as hepatitis A and E viruses, which our products have not demonstrated an ability to inactivate, or human parvovirus B-19, which is also a non-lipid-enveloped virus, for which our products have not demonstrated a high level of inactivation. While studies have demonstrated that our products can effectively inactivate a broad spectrum of pathogens in blood components, market adoption of our products may be reduced if customers determine that competitors' products inactivate a broader range of pathogens that are of particular interest to the transfusion medicine community. In addition, customers and prospective customers may believe that our competitors' products are safer, more cost effective or easier to implement and incorporate into existing blood processing procedures than INTERCEPT Blood System products. In Europe, several companies, including Grifols S.A., Octapharma AG, MacoPharma International and Kedrion Biopharma, are developing or selling commercial pathogen reduction systems or services to treat fresh frozen plasma.

MacoPharma has received CE Mark for a UVC-based product for pathogen reduced platelets. MacoPharma currently has a Phase 3 clinical trial underway in Germany to generate additional data for expanded approvals. In addition, Terumo BCT, a subsidiary of Terumo Corporation, has developed a pathogen reduction system for blood products and has been issued CE Marks for its system for both platelets and plasma. We further understand that Terumo BCT developed a pathogen reduction system for whole blood and has received a Class II CE Mark. MacoPharma or Terumo BCT's products may offer competitive advantages over our INTERCEPT Blood System. Terumo Corporation is a large Japanese-based, multinational corporation with more mature products and relationships than we have. Our ability to commercialize our products in certain markets, particularly in Japan, may be negatively affected by Terumo BCT's resources and their pre-existing relationships with regulators and customers. Should Terumo BCT's product be approved for use and commercialized in Japan, our products would likely directly compete with their products and we believe we would likely either need to establish operations in Japan or partner with a local Japanese company.

Octapharma AG received FDA approval in January 2013 to sell treated fresh frozen plasma for certain indications and is currently commercially available. Should Octapharma enter into exclusive agreements with key customers, our plasma system may encounter market resistance and we will have a more limited market into which we can sell.

In addition, we understand that Octapharma received approval to sell fresh frozen plasma in France. Octapharma's entry into the French market may pose a competitive threat to other pathogen reduced plasmas, including INTERCEPT and may in turn limit the potential market available to us in France.

Other companies developing competing products may also offer and sell other blood-banking products and services. As a result, competitors may have pre-existing long-term relationships with customers and may be able to offer synergies for both pathogen reduction and non-pathogen reduction products that we are unable to offer. Regulatory agencies may mandate use of competing products which would limit our ability to sell our products in those markets.

New methods of testing whole blood for specific pathogens have been approved by the FDA and in Europe, as have tests for bacteria in platelets. Other companies are marketing rapid, point-of-care bacterial tests, and developing synthetic blood product substitutes and products to stimulate the growth of platelets. Development and commercialization of any of these or other related technologies could limit the potential market for our products as would a mandate of any competing technology other than INTERCEPT.

We may be liable and we may need to withdraw our products from the market if our products harm people. We may be liable if an accident occurs in our controlled use of hazardous materials. Our insurance coverage may be inadequate to offset losses we may incur.

We are exposed to potential liability risks inherent in the testing and marketing of medical devices. We may be liable if any of our products cause injury, illness or death. Although we will have completed preclinical and clinical safety testing prior to marketing our products, there may be harmful effects caused by our products that we are unable to identify in preclinical or clinical testing. In particular, unforeseen, rare reactions or adverse side effects related to long-term use of our products may not be observed until the products are in widespread commercial use. Because of the limited duration and number of patients receiving blood components treated with the INTERCEPT Blood System products in clinical trials, it is possible that harmful effects of our products not observed in preclinical and clinical testing could be discovered after a marketing approval has been received. For example, in cases where we have obtained regulatory approval for our products, we have demonstrated pathogen reduction to specified levels based on well-established tests. However, there is no way to determine, after treatment by our products, whether our products have completely inactivated all of the pathogens that may be present in blood components. There is also no way to determine whether any residual amount of a pathogen remains in the blood component treated by our products and there is no way to exclude that such residual amount would be enough to cause disease in the transfused patient or was a result of a potential defect or lack of efficacy of our products. For ethical reasons, we cannot conduct human testing to determine whether an individual who receives a transfusion of a blood component containing a pathogen that was inactivated using the INTERCEPT Blood System might show positive results if tested for an antibody against that pathogen. While we believe, based on the clinical experience of our scientists, that the level of inactivated pathogens would likely be too small to induce a detectable antibody response in diagnostic tests, we cannot exclude that a transfused patient might show positive results if tested for an antibody against that pathogen. We could be subject to a claim from a patient that tests positive, even though that patient did not contract a disease. In addition, should personnel at clinical study sites or ultimately, potential customers, be harmed by amustaline, or believe they have been or could be harmed by amustaline, our insurance coverage may be insufficient to provide coverage for any related potential liabilities. Amustaline is considered a potent chemical and is the active compound of our red blood cell system.

We maintain product liability insurance, but do not know whether the insurance will provide adequate coverage against potential liabilities. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our products.

Our research and development activities involve the controlled use of hazardous materials, including certain hazardous chemicals, radioactive materials and infectious pathogens, such as HIV and hepatitis viruses. Although we believe that our safety procedures for handling and disposing of hazardous materials are adequate and comply with regulatory requirements, we cannot eliminate the risk of accidental contamination or injury. If an accident occurs, we could be held liable for any damages that result.

A recall of our products, either voluntarily or at the direction of the FDA or another governmental authority, or the discovery of serious safety issues with our products that leads to corrective actions, could have a significant adverse impact on us.

The FDA and similar foreign governmental authorities have the authority to require the recall of commercialized products in the event of material deficiencies or defects in design or manufacture of a product or in the event that a product poses an unacceptable risk to health. The FDA's authority to require a recall must be based on an FDA finding that there is reasonable probability that the device would cause serious injury or death. Manufacturers may also, under their own initiative, recall a product if any material deficiency in a device is found or withdraw a product to improve device performance or for other reasons. The FDA requires that certain classifications of recalls be reported to the FDA within ten working days after the recall is initiated. A government-mandated or voluntary recall by us or one of our distributors could occur as a result of an unacceptable risk to health, component failures, malfunctions, manufacturing errors, design or labeling defects or other deficiencies and issues. For example, in April 2018, we instituted a voluntary recall in the E.U. of a specified lot of our disposable platelet kits after identifying the possibility of an incomplete seal where the tubing meets the base of the sampling pouch, which is used to obtain a sample of the INTERCEPT-treated platelets. In addition, in September 2018, we instituted a voluntary recall in the U.S. of a specified lot after we identified the possibility that an incorrect sized bag may have been used in the manufacture of INTERCEPT platelet kits. Regulatory agencies in other countries have similar authority to recall devices because of material deficiencies or defects in design or manufacture that could endanger health. Any recall would divert management attention and financial resources and could cause the price of our stock to decline, expose us to product liability or other claims and harm our reputation with customers. Such events could impair our ability to supply our products in a cost-effective and timely manner in order to meet our customers' demands. Companies are required to maintain certain records of recalls, even if they are not reportable to the FDA or similar foreign governmental authorities. We may initiate voluntary recalls involving our products in the future that we determine do not require notification of the FDA or foreign governmental authorities. If the FDA or foreign governmental authorities disagree with our determinations, they could require us to report those actions as recalls. A future recall announcement could harm our reputation with customers and negatively affect our sales. In addition, the FDA or a foreign governmental authority could take enforcement action for failing to report the recalls when they were conducted.

In addition, under the FDA's medical device reporting regulations, we are required to report to the FDA any incident in which our products may have caused or contributed to a death or serious injury or in which our product malfunctioned and, if the malfunction were to recur, would likely cause or contribute to death or serious injury. Repeated product malfunctions may result in a voluntary or involuntary product recall. We are also required to follow detailed recordkeeping requirements for all firm-initiated medical device corrections and removals, and to report such corrective and removal actions to FDA if they are carried out in response to a risk to health and have not otherwise been reported under the medical device reporting regulations. If we do not adequately address problems associated with our devices, we may face additional regulatory enforcement action, including FDA warning letters, product seizure, injunctions, administrative penalties, or civil or criminal fines. We may also be required to bear other costs or take other actions that may have a negative impact on our sales as well as face significant adverse publicity or regulatory consequences, which could harm our business, including our ability to market our products in the future.

Any adverse event involving our products, whether in the U.S. or abroad could result in future voluntary corrective actions, such as recalls or customer notifications, or agency action, such as inspection, mandatory recall or other enforcement action. Any corrective action, whether voluntary or involuntary, as well as defending ourselves in a lawsuit, will require the dedication of our time and capital, distract management from operating our business and may harm our reputation and financial results.

If we fail to obtain the capital necessary to fund our future operations or if we are unable to generate positive cash flows from our operations, we will need to curtail planned development or sales and commercialization activities.

Our near-term capital requirements are dependent on various factors, including operating costs and working capital investments associated with commercializing the INTERCEPT Blood System, including in connection with the continuing U.S. commercial launch of our platelet and plasma systems, costs to develop different configurations of existing products and new products, including our illuminator, costs associated with planning, enrolling and completing ongoing studies, and the post-approval studies we are required to conduct in connection with the FDA approval of the platelet system, costs associated with pursuing potential regulatory approvals in other geographies where we do not currently sell our platelet and plasma systems, costs associated with conducting *in vitro* studies and clinical development of our red blood cell system in Europe and the U.S., costs associated with performing the agreed-upon activities under our BARDA agreement, and costs related to creating, maintaining and defending our intellectual property. Our long-term capital requirements will also be dependent on the success of our sales efforts, competitive developments, the timing, costs and magnitude of our longer-term clinical trials and other development activities related to our platelet, plasma and red blood cell systems, including required post-approval studies for the platelet system, market preparedness and product launch activities for any of our products in

geographies where we do not currently sell our products, and regulatory factors. Until we are able to generate a sufficient amount of product revenue and generate positive net cash flows from operations, which we may never do, meeting our long-term capital requirements is in large part reliant on continued access to funds under our BARDA agreement and the public and private equity and debt capital markets, as well as on collaborative arrangements with partners, augmented by cash generated from operations and interest income earned on the investment of our cash balances. While we believe that our available cash and cash equivalents and short-term investments, as well as cash received from product sales and under our agreement with BARDA, will be sufficient to meet our capital requirements for at least the next twelve months, if we are unable to generate sufficient product revenue, or access sufficient funds under our BARDA agreement or the public and private equity and debt capital markets, we may be unable to execute successfully on our operating plan. We have based our cash sufficiency estimate on assumptions that may prove to be incorrect. If our assumptions prove to be incorrect, we could consume our available capital resources sooner than we currently expect or in excess of amounts than we currently expect, which could adversely affect our commercialization and clinical development activities.

We have borrowed and in the future may borrow additional capital from institutional and commercial banking sources to fund future growth, including pursuant to our Credit, Security and Guaranty Agreement (Term Loan), or the Term Loan Credit Agreement, and our Credit, Security and Guaranty Agreement (Revolving Loan), or the Revolving Loan Credit Agreement, both with MidCap Financial Trust, or MidCap, as described below, or potentially pursuant to new arrangements with different lenders. We may borrow funds on terms that may include restrictive covenants, including covenants that restrict the operation of our business, liens on assets, high effective interest rates, financial performance covenants and repayment provisions that reduce cash resources and limit future access to capital markets. In addition, we expect to continue to opportunistically seek access to the equity capital markets to support our development efforts and operations. To the extent that we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. To the extent that we raise additional funds through collaboration or partnering arrangements, we may be required to relinquish some of our rights to our technologies or rights to market and sell our products in certain geographies, grant licenses on terms that are not favorable to us, or issue equity that may be substantially dilutive to our stockholders.

While we expect to receive significant funding under our five-year agreement with BARDA, our ability to obtain the funding we expect to receive under the agreement is subject to various risks and uncertainties, including with respect to BARDA's ability to terminate the agreement for convenience at any time and our ability to achieve the required milestones under the agreement. In addition, access to federal contracts is subject to the authorization of funds and approval of our research plans by various organizations within the federal government, including the U.S. Congress. The general economic environment, coupled with tight federal budgets, has led to a general decline in the amount available for government funding. If BARDA were to eliminate, reduce or delay funding under our agreement, this would have a significant negative impact on the programs associated with such funding and could have a significant negative impact on our revenues and cash flows. In addition, if we are unable to generate sufficient requisite Phase 3 clinical data and/or reach agreement with the FDA on an additional Phase 3 clinical trial for chronic anemia in the U.S. for our red blood cell system, our agreement with BARDA will be severely limited in scope or could be terminated altogether, and our ability to complete the development activities required for licensure in the U.S. may require additional capital beyond which we currently have. If alternative sources of funding are not available, we may be forced to suspend or terminate development activities related to the red blood cell system in the U.S.

As a result of economic conditions, general global economic uncertainty, political change, and other factors, we do not know whether additional capital will be available when needed, or that, if available, we will be able to obtain additional capital on reasonable terms. If we are unable to raise additional capital due to the volatile global financial markets, general economic uncertainty or other factors, we may need to curtail planned development or commercialization activities. In addition, we may need to obtain additional funds to complete development activities for the red blood cell system if additional studies are necessary for regulatory approval in Europe, which would increase our costs and potentially delay the approval. We may need to obtain additional funding to conduct additional randomized controlled clinical trials for existing or new products, particularly if we are unable to access any additional portions of the funding contemplated by our BARDA agreement, and we may choose to defer such activities until we can obtain sufficient additional funding or, at such time, our existing operations provide sufficient cash flow to conduct these trials.

Covenants in our Term Loan Credit Agreement and Revolving Loan Credit Agreement restrict our business and operations in many ways and if we do not effectively manage our covenants, our financial conditions and results of operations could be adversely affected. In addition, our operations may not provide sufficient cash to meet the repayment obligations of our debt incurred under the Term Loan Credit Agreement.

As of June 30, 2019, our total indebtedness under our Term Loan Credit Agreement was approximately \$39.3 million. All of our current and future assets, except for intellectual property and 35% of our investment in our subsidiary, Cerus Europe B.V., are secured for our borrowings under the Term Loan Credit Agreement and Revolving Loan Credit Agreement. The Term Loan Credit Agreement and Revolving Loan Credit Agreement require that we comply with certain covenants applicable to us and our subsidiary, including among other things, covenants restricting dispositions, changes in business, management, ownership or business locations, mergers or acquisitions, indebtedness, encumbrances, distributions, investments, transactions with affiliates and subordinated debt, any of which could restrict our business and operations, particularly our ability to respond to changes in our business or to take specified actions to take advantage of certain business opportunities that may be presented to us. In addition, receipt of a qualified audit opinion (other

than as to going concern or a qualification resulting solely from the scheduled maturity of term loans occurring within one year from the date such opinion is delivered) would be a violation of an affirmative covenant under the Term Loan Credit Agreement . While we believe that our available cash and cash equivalents and short-term investments, as well as cash to be received from product sales and under our agreement with BARDA, will be sufficient to meet our capital requirements for at least the next twelve months , if we are unable to generate sufficient product revenue, or access sufficient funds under our BARDA agreement or the public and private equity and debt capital markets, we may be unable to execute successfully on our operating plan. Our failure to comply with any of the covenants could result in a default under the Term Loan Credit Agreement or the Revolving Loan Credit Agreement , which could permit the lenders to declare all or part of any outstanding borrowings to be immediately due and payable, or to refuse to permit additional borrowings under the Term Loan Credit Agreement or the Revolving Loan Credit Agreement . If we are unable to repay those amounts, the lenders under the Term Loan Credit Agreement or the Revolving Loan Credit Agreement could proceed against the collateral granted to them to secure that debt, which would seriously harm our business. In addition, should we be unable to comply with these or certain other covenants or if we default on any portion of our outstanding borrowings, the lenders can also impose an exit fee of a percentage of the amount borrowed pursuant to the Term Loan Credit Agreement .

Virtually all of our research and development activities and the significant majority of our general and administrative activities are performed in or managed from a single site that may be subject to lengthy business interruption in the event of a severe earthquake. We also may suffer loss of computerized information and may be unable to make timely filings with regulatory agencies in the event of catastrophic failure of our data storage and backup systems.

Virtually all of our research and development activities and the significant portion of our general and administrative activities are performed in or managed from our facilities in Concord, California, which are within an active earthquake fault zone. Should a severe earthquake occur, we might be unable to occupy our facilities or conduct research and development and general and administrative activities in support of our business and products until such time as our facilities could be repaired and made operational. Our property and casualty and business interruption insurance in general does not cover losses caused by earthquakes. While we have taken certain measures to protect our scientific, technological and commercial assets, a lengthy or costly disruption due to an earthquake would have a material adverse effect on us. We have also taken measures to limit damage that may occur from the loss of computerized data due to power outage, system or component failure or corruption of data files. However, we may lose critical computerized data, which may be difficult or impossible to recreate, which may harm our business. We may be unable to make timely filings with regulatory agencies in the event of catastrophic failure of our data storage and backup systems, which may subject us to fines or adverse consequences, up to and including loss of our ability to conduct business.

We relocated our corporate headquarters. As a result, we will need to update our existing regulatory applications to reflect the change in our corporate headquarters, including an update to regulatory applications with in-country ministries of health in some territories. Delays or problems resulting from the move may cause a delay in our ability to commence or complete these studies or interrupt our ability to supply product to our customers in affected territories.

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

Our business is increasingly dependent on complex and interdependent information technology systems, including internet-based systems, databases and programs, to support our business processes as well as internal and external communications. As use of information technology systems has increased, deliberate attacks and attempts to gain unauthorized access to computer systems and networks have increased in frequency and sophistication. Our information technology, systems and networks are potentially vulnerable to breakdown, malicious intrusion and computer viruses which may result in the impairment of production and key business processes or loss of data or information. We are also potentially vulnerable to data security breaches—whether by employees or others—which may expose sensitive data to unauthorized persons. For example, we have in the past and may in the future be subject to “phishing” attacks in which third parties send emails purporting to be from reputable sources. Phishing attacks may attempt to obtain personal information, infiltrate our systems to initiate wire transfers or otherwise obtain proprietary or confidential information. Although we have not experienced any losses as a result of such attacks or any other breaches of data security, such breaches could lead to the loss of trade secrets or other intellectual property, or could lead to the public exposure of personal information (including sensitive personal information) of our employees, clinical trial patients, distributors, customers and others. Breaches and other inappropriate access can be difficult to detect and any delay in identifying them could increase their harm. While we have implemented security measures to protect our data security and information technology systems, such measures may not prevent such events. Any such breaches of security and inappropriate access could disrupt our operations, harm our reputation or otherwise have a material adverse effect on our business, financial condition and results of operations.

If we fail to attract, retain and motivate key personnel or to retain the members of our executive management team, our operations and our future growth may be adversely affected.

We are highly dependent upon our executive management team and other critical personnel, including our specialized research and development, regulatory and operations personnel, many of whom have been employed with us for many years and have a significant amount of institutional knowledge about us and our products. We do not carry “key person” insurance. If one or more members of our executive management team or other key personnel were to retire or resign, our ability to achieve development, regulatory or operational milestones for commercialization of our products could be adversely affected if we are unable to replace them with employees of comparable knowledge and experience. In addition, we may not be able to retain or recruit other qualified individuals, and our efforts at knowledge transfer could be inadequate. If knowledge transfer, recruiting and retention efforts are inadequate, significant amounts of internal historical knowledge and expertise could become unavailable to us.

We also rely on our ability to attract, retain and motivate skilled and highly qualified personnel in order to grow our company. Competition for qualified personnel in the medical device and pharmaceutical industry is very intense. If we are unable to attract, retain and motivate quality individuals, our business, financial condition, ability to perform under our BARDA agreement, or results of operations and growth prospects could be adversely affected. Even if we are able to identify and hire qualified personnel commensurate with our growth objectives and opportunities, the process of integrating new employees is time consuming, costly and distracting to existing employees and management. Such disruptions may have an adverse impact on our operations, our ability to service existing markets and customers, or our ability to comply with regulations and laws.

All of the employees of our subsidiary, Cerus Europe B.V., are employed outside the U.S., including in France, where labor and employment laws are relatively stringent and, in many cases, grant significant job protection to certain employees, including rights on termination of employment. In addition, one of our manufacturing partners that we are dependent on is located in France and may have employees that are members of unions or represented by a works council as required by law. These more stringent labor and employment laws to the extent that they are applicable, coupled with the requirement to consult with the relevant unions or works’ councils, could increase our operational costs with respect to our own employees and could result in passed through operational costs by our manufacturing partner. If the increased operational costs become significant, our business, financial condition and results of operations could be adversely impacted.

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

Our ability to use our federal and state net operating loss, or NOL, carryforwards to offset potential future taxable income and related income taxes that would otherwise be due is dependent upon our generation of future taxable income before the expiration dates of the NOL carryforwards, and we cannot predict with certainty when, or whether, we will generate sufficient taxable income to use all of our NOL carryforwards. On December 22, 2017, President Trump signed into law the Tax Act. Under the Tax Act, federal net operating losses incurred in 2018 and in future years may be carried forward indefinitely, but the deductibility of such federal net operating losses is limited. It is uncertain if and to what extent various states will conform to the Tax Act. In addition, utilization of NOL carryforwards to offset potential future taxable income and related income taxes that would otherwise be due is subject to annual limitations under the “ownership change” provisions of Sections 382 of the Internal Revenue Code of 1986, as amended, or the Code, and similar state provisions, which may result in the expiration of NOL carryforwards before future utilization. In general, under the Code, 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 NOL carryforwards and other pre-change tax attributes (such as research and development credit carryforwards) to offset its post-change taxable income or taxes may be limited. Our equity offerings and other changes in our stock ownership, some of which are outside of our control, may have resulted or could in the future result in an ownership change. Although we have completed studies to provide reasonable assurance that an ownership change limitation would not apply, we cannot be certain that a taxing authority would reach the same conclusion. If, after a review or audit, an ownership change limitation were to apply, utilization of our domestic NOL and tax credit carryforwards could be limited in future periods and a portion of the carryforwards could expire before being available to reduce future income tax liabilities.

We may not be able to protect our intellectual property or operate our business without infringing intellectual property rights of others.

Our commercial success will depend, in part, on obtaining and maintaining patent protection on our products and successfully defending our products against third-party challenges. Our technology will be protected from unauthorized use only to the extent that it is covered by valid and enforceable patents or effectively maintained as trade secrets. As a result, our success depends in part on our ability to:

- obtain patents;
- protect trade secrets;

- operate without infringing upon the proprietary rights of others; and
- prevent others from infringing on our proprietary rights.

We cannot be certain that our patents or patents that we license from others will be enforceable and afford protection against competitors. Our patents or patent applications, if issued, may be challenged, invalidated or circumvented. Our patent rights may not provide us with proprietary protection or competitive advantages against competitors with similar technologies. Others may independently develop technologies similar to ours or independently duplicate our technologies. For example, we are aware of a recently expired U.S. patent issued to a third-party that covers methods to remove psoralen compounds from blood products. We have reviewed the patent and believe there exist substantial questions concerning its validity. We cannot be certain, however, that a court would hold the patent to be invalid or not infringed by our platelet or plasma systems. In this regard, whether or not we have infringed this patent will not be known with certainty unless and until a court interprets the patent in the context of litigation. In the event that we are found to have infringed any valid claim of this patent, we may, among other things, be required to pay damages. Our patents expire at various dates between 2019 and 2031. Recent patent applications will, if granted, result in patents with later expiration dates. In addition, we have a license from Fresenius to U.S. and foreign patents relating to the INTERCEPT Blood System, which expire at various dates between 2019 and 2024. Due to the extensive time required for development, testing and regulatory review of our potential products, our patents may expire or remain in existence for only a short period following commercialization. This would reduce or eliminate any advantage of the patents.

We cannot be certain that we were the first to make the inventions covered by each of our issued patents or pending patent applications or that we were the first to file patent applications for such inventions. We may need to license the right to use third-party patents and intellectual property to continue development and commercialization of our products, including in connection with our planned commercialization of the platelet and plasma systems in the U.S. We may not be able to acquire such required licenses on acceptable terms, if at all. If we do not obtain such licenses, we may need to design around other parties' patents, or we may not be able to proceed with the development, manufacture or sale of our products.

Our patents do not cover all of the countries in which we are selling, and planning to sell, our products. We will not be able to prevent potential competitors from using our technology in countries where we do not have patent coverage. Further, the laws of some foreign countries may not protect intellectual property rights to the same extent as the laws of the U.S., including the CIS countries, China and India, jurisdictions where we are currently expanding our commercialization efforts through distributors. In certain countries, compulsory licensing laws exist that may be used to compel a patent owner to grant licenses to third parties, for reasons such as non-use of the patented subject matter within a certain period of time after patent grant or commercializing in a manner that is cost-prohibitive in the country. In those countries, we may have limited remedies if our patents are infringed or if we are compelled to grant a license for INTERCEPT to a third party, which could materially diminish the value of such patents. This could adversely impact our potential product revenue opportunities.

We may face litigation requiring us to defend against claims of infringement, assert claims of infringement, enforce our patents, protect our trade secrets or know-how or determine the scope and validity of others' proprietary rights. Patent litigation is costly. In addition, we may require interference proceedings before the U.S. Patent and Trademark Office to determine the priority of inventions relating to our patent applications. Litigation or interference proceedings could be expensive and time consuming, and we could be unsuccessful in our efforts to enforce our intellectual property rights. We may rely, in certain circumstances, on trade secrets to protect our technology. However, trade secrets are difficult to protect. We protect our proprietary technology and processes, in part, by confidentiality agreements with employees, consultants and contractors. These agreements may be breached and we may not have adequate remedies for any breach or our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our employees, consultants or contractors use intellectual property owned by others, disputes also may arise as to the rights in related or resulting know-how and inventions.

As our international operations grow, we may be subject to adverse fluctuations in exchange rates between the U.S. dollar and foreign currencies, as well as to tariffs and other trade restrictions.

Our international operations are subject to risks typical of an international business, including, among other factors: differing political, economic, and regulatory climates, different tax structures and foreign exchange volatility. We do not currently enter into any hedging contracts to normalize the impact of foreign exchange fluctuations. As a result, our future results could be materially affected by changes in these or other factors.

Product sales of the INTERCEPT Blood System sold outside of the U.S. are typically invoiced to customers in Euros. In addition, we purchase finished INTERCEPT disposable kits for our platelet and plasma systems and incur certain operating expenses in Euros and other foreign currencies. Our exposure to foreign exchange rate volatility is a direct result of our product sales, cash collection and cash payments for expenses to support our international operations. Foreign exchange rate fluctuations are recorded as a component of other income, net on our condensed consolidated statements of operations. Significant fluctuations in the volatility of foreign currencies relative to the U.S. dollar may materially affect our results of operations. For example, the announcement of Brexit caused severe volatility in global currency exchange rate fluctuations that resulted in the strengthening of the U.S. dollar against foreign currencies in which we transact business. Should this foreign exchange volatility continue or increase, it could cause volatility in our results of operations. In addition, in a period where the U.S. dollar is strengthening/weakening as compared to Euros and other currencies we transact in, our product revenues and expenses denominated in Euros or other foreign currencies are translated into U.S. dollars at a lower/higher value than they would be in an otherwise constant currency exchange rate environment.

Currently we do not have a formal hedging program to mitigate the effects of foreign currency volatility. As our commercial operations grow globally, our operations are exposed to more currencies and as a result our exposure to foreign exchange risk will grow.

Additionally, the Trump administration has called for substantial changes to foreign trade policy and has recently imposed tariffs on certain U.S. imports. Canada, the E.U., China and other countries have responded with retaliatory tariffs on certain U.S. exports. We also rely on various U.S. corporate tax provisions related to international commerce. If we are subject to new regulations, including those under the Tax Act, or if restrictions and tariffs increase our operating costs in the future, and we are not able to recapture those costs from our customers, or if such initiatives, regulations, restrictions or tariffs make it more difficult for us to compete in overseas markets, our business, financial condition and results of operations could be adversely impacted.

If the London Inter-Bank Offered Rate, or LIBOR, is discontinued, interest payments under our Term Loan Credit Agreement or Revolving Loan Credit Agreement may be calculated using another reference rate.

In July 2017, the Chief Executive of the United Kingdom Financial Conduct Authority, or FCA, which regulates LIBOR, announced that the FCA intends to phase out the use of LIBOR by the end of 2021. In addition, the U.S. Federal Reserve, in conjunction with the Alternative Reference Rates Committee, a steering committee comprised of large U.S. financial institutions, is considering replacing U.S. dollar LIBOR with the Secured Overnight Financing Rate, or SOFR, a new index calculated by short-term repurchase agreements, backed by Treasury securities. Although there have been certain issuances utilizing SOFR, it is unknown whether this or any other alternative reference rate will attain market acceptance as a replacement for LIBOR. U.S. dollar LIBOR is used as a benchmark rate in our Term Loan Credit Agreement and Revolving Loan Credit Agreement. There remains uncertainty regarding the future utilization of LIBOR and the nature of any replacement rate, and any potential effects of the transition away from LIBOR on us are not known. The transition process may involve, among other things, increased volatility and illiquidity in markets for instruments that currently rely on LIBOR and may result in increased borrowing costs, the effectiveness of related transactions such as hedges, uncertainty under applicable documentation, including our Term Loan Credit Agreement and Revolving Loan Credit Agreement, or difficult and costly processes to amend such documentation. As a result, our ability to refinance our Term Loan Credit Agreement, Revolving Loan Credit Agreement or other indebtedness or to hedge our exposure to floating rate instruments may be impaired, which would adversely affect the operations of our business.

We currently have a limited trading volume, which results in higher price volatility for, and reduced liquidity of, our common stock.

Our shares of common stock are currently quoted on the Nasdaq Global Market under the symbol "CERS." The market for our common stock has been limited due to low trading volume and the small number of brokerage firms acting as market makers. Active trading markets generally result in lower price volatility and more efficient execution of buy and sell orders. The absence of an active trading market increases price volatility and reduces the liquidity of our common stock. As long as this condition continues, the sale of a significant number of shares of common stock at any particular time could be difficult to achieve at the market prices prevailing immediately before such shares are offered, which may limit our ability to effectively raise money. In addition, due to the limitations of our market and the volatility in the market price of our stock, investors may face difficulties in selling shares at attractive prices when they want to sell. As a result of this lack of trading activity, the quoted price for our common stock is not necessarily a reliable indicator of its fair market value.

We are obligated to develop and maintain proper and effective internal control over financial reporting. In the future, we may not complete our analysis of our internal control over financial reporting in a timely manner, or these internal controls may not be determined to be effective, which may adversely affect investor confidence in our company and, as a result, the value of our common stock.

We are required, pursuant to Section 404 of the Sarbanes-Oxley Act, to furnish a report by management on, among other things, the effectiveness of our internal control over financial reporting. This assessment includes disclosure of any material weakness identified by our management in our internal control over financial reporting, as well as a statement that our independent registered public accounting firm has issued an attestation report on the effectiveness of our internal control over financial reporting.

Complying with Section 404 requires a rigorous compliance program as well as adequate time and resources. As a result of expanding our commercialization efforts, developing, improving and expanding our core information technology systems as well as implementing new systems to support our sales, supply chain activities and reporting capabilities, all of which require significant management time and support, we may not be able to complete our internal control evaluation, testing and any required remediation in a timely fashion. Additionally, if we identify one or more material weaknesses in our internal control over financial reporting, we will not be able to assert that our internal controls are effective. For example, our management concluded that our internal control over financial reporting was ineffective as of December 31, 2014, because material weaknesses existed in our internal control over financial reporting related to the valuation of our inventory and cost of product revenue and the timeliness and accuracy of recording adjustments to certain accrued liabilities as reported on our condensed consolidated balance sheets and statements of operations. Although we have been able to successfully remediate those internal control deficiencies, to the extent we identify future weaknesses or deficiencies, there could be material misstatements in our condensed consolidated financial statements and we could fail to meet our financial reporting obligations. As a result, our ability to obtain additional financing, or obtain additional financing on favorable terms, could be materially and adversely affected which, in turn, could materially and adversely affect our business, our financial condition and the value of our common stock. If we are unable to assert that our internal control over financial reporting is effective in the future, or if our independent registered public accounting firm is unable to express an opinion or expresses an adverse opinion on the effectiveness of our internal controls in the future, investor confidence in the accuracy and completeness of our financial reports could be further eroded, which would have a material adverse effect on the price of our common stock.

Provisions of our charter documents, our stockholder rights plan, our compensatory arrangements and Delaware law could make it more difficult for a third party to acquire us, even if the offer may be considered beneficial by our stockholders.

Provisions of the Delaware General Corporation Law could discourage potential acquisition proposals and could delay, deter or prevent a change in control. The anti-takeover provisions of the Delaware General Corporation Law impose various impediments to the ability of a third party to acquire control of us, even if a change in control would be beneficial to our existing stockholders. In addition, Section 203 of the Delaware General Corporation Law, unless its application has been waived, provides certain default anti-takeover protections in connection with transactions between us and an “interested stockholder”. Generally, Section 203 prohibits stockholders who, alone or together with their affiliates and associates, own more than 15% of the subject company from engaging in certain business combinations for a period of three years following the date that the stockholder became an interested stockholder of such subject company without approval of the board or the vote of two-thirds of the shares held by the independent stockholders. Our board of directors has also adopted a stockholder rights plan, or “poison pill,” which would significantly dilute the ownership of a hostile acquirer. Additionally, provisions of our amended and restated certificate of incorporation and bylaws could deter, delay or prevent a third party from acquiring us, even if doing so would benefit our stockholders, including without limitation, the authority of the board of directors to issue, without stockholder approval, preferred stock with such terms as the board of directors may determine. In addition, our executive employment agreements, change of control severance benefit plan and equity incentive plans and agreements thereunder provide for certain severance benefits in connection with a change of control of us, including single-trigger equity vesting acceleration benefits with respect to outstanding stock options, which could increase the costs to a third party acquirer and/or deter such third party from acquiring us.

The Tax Act could adversely affect our business and financial condition.

The Tax Act significantly changes the Internal Revenue Code of 1986, as amended. The Tax Act, among other things, contains significant changes to corporate taxation, including reduction of the corporate tax rate on future earnings to 21%, limitation of the future tax deduction for net interest expense, limitation of the deduction for future net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, changes in the treatment of offshore earnings regardless of whether they are repatriated, mandatory capitalization of research and development expenses, further deduction limits on executive compensation and modifying, repealing and creating many other business deductions and credits. Our federal net operating loss carryovers generated in 2018 and thereafter will be carried forward indefinitely pursuant to the Tax Act. We continue to examine the impact this tax reform legislation may have on our business. In addition, it is uncertain if and to what extent various states will conform to the Tax Act. The impact of the Tax Act on holders of our common stock is also uncertain and could be adverse. We urge our stockholders to consult with their legal and tax advisors with respect to such legislation and the potential tax consequences of investing in our common stock.

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

None.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. E XHIBITS

<u>Exhibit Number</u>	<u>Description of Exhibit</u>
3.1 (1)	Amended and Restated Certificate of Incorporation of Cerus Corporation.
3.2 (1)	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Cerus Corporation.
3.3 (4)	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Cerus Corporation.
3.4 (1)	Certificate of Designation of Series C Junior Participating Preferred Stock of Cerus Corporation.
3.5 (2)	Amended and Restated Bylaws of Cerus Corporation.
3.6 (5)	Certificate of Eliminations of Series A Preferred Stock and Series C Junior Participating Preferred Stock of Cerus Corporation.
4.1 (3)	Specimen Stock Certificate (see Exhibit 4.2 to Form S-1 Registration Statement filed with the SEC on January 8, 1997).
10.1	Amended and Restated 2008 Equity Incentive Plan, effective June 5, 2019.
31.1	Certification of the Principal Executive Officer of Cerus Corporation pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of the Principal Financial Officer of Cerus Corporation pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1 (6)	Certification of the Principal Executive Officer and Principal Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	XBRL Taxonomy Extension Schema Document.
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.

- (1) Incorporated by reference to the like-described exhibit to the Registrant's Quarterly Report on Form 10-Q (File No. 000-21937), for the quarter ended September 30, 2012.
- (2) Incorporated by reference to the like-described exhibit to the Registrant's Current Report on Form 8-K (File No. 000-21937), filed with the SEC on June 19, 2008.
- (3) Incorporated by reference to the like-described exhibit to the Registrant's Registration Statement on Form S-1 (File No. 333-11341) and amendments thereto.
- (4) Incorporated by reference to the like-described exhibit to the Registrant's Quarterly Report on Form 10-Q (File No. 000-21937), for the quarter ended June 30, 2014.
- (5) Incorporated by reference to the like-described exhibit to the Registrant's Current Report on Form 8-K (File No. 000-21937), filed with the SEC on March 5, 2019
- (6) This certification accompanies the Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission, and is not incorporated by reference into any filing of the Registrant 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.

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.

CERUS CORPORATION

Date: August 1, 2019

/s/ Kevin D. Green

Kevin D. Green

Vice President, Finance and Chief Financial Officer

(on behalf of registrant and as Principal Financial Officer)

CERUS CORPORATION
 AMENDED AND RESTATED 2008 EQUITY INCENTIVE PLAN

APPROVED BY THE BOARD OF DIRECTORS ON: APRIL 19, 2017
 APPROVED BY STOCKHOLDERS ON: JUNE 7, 2017
 AMENDED AND RESTATED BY THE BOARD OF DIRECTORS ON: APRIL 19, 2019
 AMENDED AND RESTATED BY THE BOARD OF DIRECTORS ON: MAY 23, 2019
 APPROVED BY STOCKHOLDERS ON: JUNE 5, 2019
 TERMINATION DATE: APRIL 21, 2023

1. GENERAL .

(a) Successor and Continuation of Prior Plans . The Plan is intended as the successor to and continuation of the Cerus Corporation 1999 Equity Incentive Plan, as amended, and the Cerus Corporation 1998 Non-Officer Stock Option Plan (the “*Prior Plans*”). Following the Effective Date, no additional stock awards shall be granted under the Prior Plans. Any shares remaining available for future awards under the Prior Plans as of the Effective Date (the “*Prior Plans Available Reserve*”) shall become available for issuance pursuant to Awards granted hereunder. From and after the Effective Date, all outstanding stock awards granted under either of the Prior Plans (each, a “*Prior Plan Award*”) shall remain subject to the terms of the applicable Prior Plan, and from and after June 7, 2017, all outstanding stock awards granted under the Cerus Corporation Inducement Plan (the “*Inducement Plan*”) (each, an “*Inducement Plan Award*”) shall remain subject to the terms of the Inducement Plan; *provided, however*, that (i) any shares subject to any outstanding Prior Plan Award that, on or after the Effective Date, expires or terminates for any reason prior to exercise or settlement and (ii) any shares subject to any outstanding Inducement Plan Award as of April 13, 2017 that, on or after June 7, 2017, expires or terminates for any reason prior to exercise or settlement (collectively, the “*Returning Shares*”) shall become available for issuance pursuant to Awards granted hereunder. All Awards granted on or after the Effective Date of this Plan shall be subject to the terms of this Plan.

(b) Eligible Award Recipients . The persons eligible to receive Awards are Employees, Directors and Consultants.

(c) Available Awards . The Plan provides for the grant of the following Awards: (i) Incentive Stock Options, (ii) Nonstatutory Stock Options, (iii) Restricted Stock Awards, (iv) Restricted Stock Unit Awards, (v) Stock Appreciation Rights, (vi) Performance Stock Awards, (vii) Performance Cash Awards, and (viii) Other Stock Awards.

(d) General Purpose . The Company, by means of the Plan, seeks to secure and retain the services of the group of persons eligible to receive Awards as set forth in Section 1(b), to provide incentives for such persons to exert maximum efforts for the success of the Company and any Affiliate and to provide a means by which such eligible recipients may be given an opportunity to benefit from increases in value of the Common Stock through the granting of Stock Awards.

(e) Section 162(m) Transition Relief . Notwithstanding anything in the Plan to the contrary, any provision in the Plan that refers to “performance-based compensation” under

Section 162(m) of the Code will only apply to any Award that is intended to qualify, and is eligible to qualify, as “performance-based compensation” under Section 162(m) of the Code pursuant to the transition relief provided by the Tax Cuts and Jobs Act (the “*TCJA*”) for remuneration provided pursuant to a written binding contract which was in effect on November 2, 2017 and which is not modified in any material respect on or after such date, as determined by the Board, in its sole discretion, in accordance with the *TCJA* and any applicable guidance, rulings or regulations issued by the U.S. Department of the Treasury, the Internal Revenue Service or any other governmental authority.

2. ADMINISTRATION .

(a) Administration by Board . The Board shall administer the Plan unless and until the Board delegates administration of the Plan to a Committee or Committees, as provided in Section 2(c).

(b) Powers of Board . The Board shall have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine from time to time (A) which of the persons eligible under the Plan shall be granted Awards; (B) when and how each Award shall be granted; (C) what type or combination of types of Award shall be granted; (D) the provisions of each Award granted (which need not be identical), including the time or times when a person shall be permitted to receive cash or Common Stock pursuant to a Stock Award; and (E) the number of shares of Common Stock with respect to which a Stock Award shall be granted to each such person.

(ii) To construe and interpret the Plan and Awards, and to establish, amend and revoke rules and regulations for the Plan’s administration. The Board, in the exercise of this power, may correct any defect, omission or inconsistency in the Plan or in any Stock Award Agreement or in the written terms of a Performance Cash Award, in a manner and to the extent it shall deem necessary or expedient to make the Plan or Award fully effective.

(iii) To settle all controversies regarding the Plan and Awards.

(iv) To accelerate the time at which a Stock Award may first be exercised or the time during which an Award or any part thereof will vest in accordance with the Plan, notwithstanding the provisions in the Award stating the time at which it may first be exercised or the time during which it will vest.

(v) To suspend or terminate the Plan at any time. Suspension or termination of the Plan shall not impair rights and obligations under any Stock Award granted while the Plan is in effect except with the written consent of the affected Participant.

(vi) To amend the Plan in any respect the Board deems necessary or advisable, including, without limitation, relating to Incentive Stock Options and certain nonqualified deferred compensation under Section 409A of the Code and to bring the Plan and/or Stock Awards into compliance therewith, subject to the limitations, if any, of applicable law. However, except as provided in Section 9(a) relating to Capitalization Adjustments, stockholder approval shall be required for any amendment of the Plan that either (A) materially increases the

number of shares of Common Stock available for issuance under the Plan, (B) materially expands the class of individuals eligible to receive Awards under the Plan, (C) materially increases the benefits accruing to Participants under the Plan or materially reduces the price at which shares of Common Stock may be issued or purchased under the Plan, (D) materially extends the term of the Plan, or (E) expands the types of Awards available for issuance under the Plan, but only to the extent required by applicable law or listing requirements. Except as provided above, rights under any Award granted before amendment of the Plan shall not be impaired by any amendment of the Plan unless (1) the Company requests the consent of the affected Participant, and (2) such Participant consents in writing.

(vii) To submit any amendment to the Plan for stockholder approval, including, but not limited to, amendments to the Plan intended to satisfy the requirements of (A) Section 162(m) of the Code and the regulations thereunder regarding the exclusion of performance-based compensation from the limit on corporate deductibility of compensation paid to Covered Employees, (B) Section 422 of the Code regarding “incentive stock options” or (C) Rule 16b-3.

(viii) To approve forms of Award Agreements for use under the Plan and to amend the terms of any one or more Awards, including, but not limited to, amendments to provide terms more favorable to the Participant than previously provided in the Award Agreement, subject to any specified limits in the Plan that are not subject to Board discretion; *provided however*, that the Participant’s rights under any Award shall not be impaired by any such amendment unless (A) the Company requests the consent of the affected Participant, and (B) such Participant consents in writing. Notwithstanding the foregoing, subject to the limitations of applicable law, if any, and without the affected Participant’s consent, the Board may amend the terms of any one or more Awards if necessary to maintain the qualified status of the Award as an Incentive Stock Option or to bring the Award into compliance with Section 409A of the Code and Department of Treasury regulations and other interpretive guidance issued thereunder, including without limitation any such regulations or other guidance that may be issued or amended after the Effective Date.

(ix) Generally, to exercise such powers and to perform such acts as the Board deems necessary or expedient to promote the best interests of the Company and that are not in conflict with the provisions of the Plan or Awards.

(x) To adopt such procedures and sub-plans as are necessary or appropriate to permit participation in the Plan by Employees, Directors or Consultants who are foreign nationals or employed outside the United States.

(c) Delegation to Committee .

(i) General . The Board may delegate some or all of the administration of the Plan to a Committee or Committees. If administration of the Plan is delegated to a Committee, the Committee shall have, in connection with the administration of the Plan, the powers theretofore possessed by the Board that have been delegated to the Committee, including the power to delegate to a subcommittee of the Committee any of the administrative powers the Committee is authorized to exercise (and references in this Plan to the Board shall thereafter be to the Committee or subcommittee), subject, however, to such resolutions, not inconsistent with

the provisions of the Plan, as may be adopted from time to time by the Board. The Board may retain the authority to concurrently administer the Plan with the Committee and may, at any time, re-vest in the Board some or all of the powers previously delegated to the Committee, Committees, subcommittee or subcommittees.

(ii) Section 162(m) and Rule 16b-3 Compliance . In the sole discretion of the Board, the Committee may consist solely of two (2) or more Outside Directors, in accordance with Section 162(m) of the Code, or solely of two (2) or more Non-Employee Directors, in accordance with Rule 16b-3. In addition, the Board or the Committee, in its sole discretion, may (A) delegate to a Committee which need not consist of Outside Directors the authority to grant Awards to eligible persons who are either (1) not then Covered Employees and are not expected to be Covered Employees at the time of recognition of income resulting from such Stock Award, or (2) not persons with respect to whom the Company wishes to comply with Section 162(m) of the Code, or (B) delegate to a Committee which need not consist of Non-Employee Directors the authority to grant Stock Awards to eligible persons who are not then subject to Section 16 of the Exchange Act.

(d) Delegation to an Officer . The Board may delegate to one (1) or more Officers the authority to do one or both of the following (i) designate Employees who are not Officers to be recipients of Options (and, to the extent permitted by applicable law, other Stock Awards) and the terms thereof, and (ii) determine the number of shares of Common Stock to be subject to such Stock Awards granted to such Employees; *provided, however* , that the Board resolutions regarding such delegation shall specify the total number of shares of Common Stock that may be subject to the Stock Awards granted by such Officer and that such Officer may not grant a Stock Award to himself or herself. Notwithstanding anything to the contrary in this Section 2(d), the Board may not delegate to an Officer authority to determine the Fair Market Value pursuant to Section 13(x)(ii) below.

(e) Effect of Board's Decision . All determinations, interpretations and constructions made by the Board in good faith shall not be subject to review by any person and shall be final, binding and conclusive on all persons.

(f) Cancellation and Re-Grant of Stock Awards . Neither the Board nor any Committee shall have the authority to: (i) effect the reduction of the exercise price of any outstanding Option or Stock Appreciation Rights under the Plan (other than pursuant to Section 9 relating to adjustments upon changes in stock), or (ii) cancel any outstanding Options or Stock Appreciation Rights with an exercise price that is greater than the Fair Market Value on the date of cancellation in exchange for the grant in substitution therefore of cash or new Stock Awards under the Plan with an exercise price that is less than the original exercise price of the Options or Stock Appreciation Rights, unless the stockholders of the Company have approved such an action within twelve (12) months prior to such an event.

(g) Minimum Vesting Requirements . No Award granted on or after June 5, 2019 may vest (or, if applicable, be exercisable) until at least 12 months following the date of grant of the Award; *provided, however* , that shares of Common Stock up to 5% of the Share Reserve (as defined in Section 3(a)) may be issued pursuant to Awards granted on or after June 5, 2019 that do not meet such vesting (and, if applicable, exercisability) requirements.

(h) Dividends and Dividend Equivalents. Dividends or dividend equivalents may be paid or credited, as applicable, with respect to any shares of Common Stock subject to an Award, as determined by the Board and contained in the applicable Award Agreement; *provided, however*, that (i) no dividends or dividend equivalents may be paid with respect to any such shares before the date such shares have vested under the terms of such Award Agreement, (ii) any dividends or dividend equivalents that are credited with respect to any such shares will be subject to all of the terms and conditions applicable to such shares under the terms of such Award Agreement (including, but not limited to, any vesting conditions), and (iii) any dividends or dividend equivalents that are credited with respect to any such shares will be forfeited to the Company on the date, if any, such shares are forfeited to or repurchased by the Company due to a failure to meet any vesting conditions under the terms of such Award Agreement.

3. SHARES SUBJECT TO THE PLAN .

(a) Share Reserve . Subject to the provisions of Section 9(a) relating to Capitalization Adjustments, the aggregate number of shares of Common Stock that may be issued pursuant to Stock Awards from and after the Effective Date shall not exceed 43,297,190 shares (the “*Share Reserve*”), which number includes the Prior Plans Available Reserve and the Returning Shares, if any, as such shares become available from time to time. For clarity, the Share Reserve is a limitation in the number of shares of the Common Stock that may be issued pursuant to the Plan and does not limit the granting of Stock Awards except as provided in Section 7(a). Shares may be issued in connection with a merger or acquisition as permitted by NASD Rule 4350(i)(1)(A)(iii) or, if applicable, NYSE Listed Company Manual Section 303A.08, or AMEX Company Guide Section 711 and such issuance shall not reduce the number of shares available for issuance under the Plan. Furthermore, if a Stock Award (i) expires or otherwise terminates without all of the shares covered by such Stock Award having been issued or (ii) is settled in cash (*i.e.* , the holder of the Stock Award receives cash rather than stock), such expiration, termination or settlement shall not reduce (or otherwise offset) the number of shares of Common Stock that may be issued pursuant to the Plan.

(b) Fungible Share Counting.

(i) Subject to Section 3(c), the number of shares of Common Stock available for issuance under the Plan shall be reduced by: (A) one (1) share for each share of Common Stock issued pursuant to an Appreciation Award granted under the Plan; (B) one and sixty-one hundredths (1.61) shares for each share of Common Stock issued pursuant to a Full Value Award granted under the Plan prior to June 5, 2019; and (C) one and fifty-five hundredths (1.55) shares for each share of Common Stock issued pursuant to a Full Value Award granted under the Plan on or after June 5, 2019.

(ii) Subject to Section 3(c), the number of shares of Common Stock available for issuance under the Plan shall be increased by: (A) one (1) share for each Returning Share or share of Common Stock that again becomes available for issuance under the Plan pursuant to Section 3(c)(i), in each case that is subject to an Appreciation Award; (B) one and sixty-one hundredths (1.61) shares for each Returning Share or share of Common Stock that again becomes available for issuance under the Plan pursuant to Section 3(c)(i), in each case that is subject to a Full Value Award that returns to the Plan prior to June 5, 2019; and (C) one and

fifty-five hundredths (1.55) shares for each Returning Share or share of Common Stock that again becomes available for issuance under the Plan pursuant to Section 3(c) (i) , in each case that is subject to a Full Value Award that returns to the Plan on or after June 5, 2019 .

(c) Reversion of Shares to the Share Reserve .

(i) Shares Available For Subsequent Issuance . If any shares of Common Stock issued pursuant to a Stock Award are forfeited back to the Company because of the failure to meet a contingency or condition required to vest such shares in the Participant, then the shares which are forfeited shall revert to and again become available for issuance under the Plan. Notwithstanding the provisions of this Section 3(c)(i), any such shares shall not be subsequently issued pursuant to the exercise of Incentive Stock Options.

(ii) Shares Not Available For Subsequent Issuance . The following shares of Common Stock shall not become available again for issuance under the Plan: (A) any shares that are reacquired or withheld (or not issued) by the Company to satisfy the exercise, strike or purchase price of a Stock Award, a Prior Plan Award or an Inducement Plan Award (including any shares subject to such award that are not delivered because such award is exercised through a reduction of shares subject to such award (i.e., “net exercised”)); (B) any shares that are reacquired or withheld (or not issued) by the Company to satisfy a tax withholding obligation in connection with a Stock Award, a Prior Plan Award or an Inducement Plan Award; (C) any shares repurchased by the Company on the open market with the proceeds of the exercise, strike or purchase price of a Stock Award, a Prior Plan Award or an Inducement Plan Award; and (D) in the event that a Stock Appreciation Right granted under the Plan or a stock appreciation right granted under either of the Prior Plans or the Inducement Plan is settled in shares of Common Stock, the gross number of shares of Common Stock subject to such award.

(d) Incentive Stock Option Limit . Notwithstanding anything to the contrary in this Section 3(d), subject to the provisions of Section 9(a) relating to Capitalization Adjustments, the aggregate maximum number of shares of Common Stock that may be issued pursuant to the exercise of Incentive Stock Options shall be the Share Reserve.

(e) Section 162(m) Limitation on Annual Grants . Subject to the provisions of Section 9(a) relating to Capitalization Adjustments, at such time as the Company may be subject to the applicable provisions of Section 162(m) of the Code, no Employee shall be eligible to be granted during any calendar year Stock Awards whose value is determined by reference to an increase over an exercise or strike price of at least one hundred percent (100%) of the Fair Market Value on the date the Stock Award is granted (that is, Options or Stock Appreciation Rights) covering more than eight hundred thousand (800,000) shares of Common Stock.

(f) Source of Shares . The stock issuable under the Plan shall be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by the Company on the market or otherwise.

4. ELIGIBILITY .

(a) Eligibility for Specific Stock Awards . Incentive Stock Options may be granted only to employees of the Company or a parent corporation or subsidiary corporation (as such

terms are defined in Sections 424(e) and (f) of the Code). Stock Awards other than Incentive Stock Options may be granted to Employees, Directors and Consultants.

(b) Ten Percent Stockholders . A Ten Percent Stockholder shall not be granted an Incentive Stock Option unless the exercise price of such Option is at least one hundred ten percent (110%) of the Fair Market Value on the date of grant and the Option is not exercisable after the expiration of five (5) years from the date of grant.

(c) Consultants . A Consultant shall be eligible for the grant of a Stock Award only if, at the time of grant, a Form S-8 Registration Statement under the Securities Act (“**Form S-8**”) is available to register either the offer or the sale of the Company’s securities to such Consultant because of the nature of the services that the Consultant is providing to the Company, because the Consultant is a natural person, or because of any other rule governing the use of Form S-8.

5. OPTION PROVISIONS .

Each Option shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. All Options shall be separately designated Incentive Stock Options or Nonstatutory Stock Options at the time of grant, and, if certificates are issued, a separate certificate or certificates shall be issued for shares of Common Stock purchased on exercise of each type of Option. If an Option is not specifically designated as an Incentive Stock Option, then the Option shall be a Nonstatutory Stock Option. The provisions of separate Options need not be identical; *provided, however* , that each Option Agreement shall include (through incorporation of provisions hereof by reference in the Option Agreement or otherwise) the substance of each of the following provisions:

(a) Term . Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, no Option shall be exercisable after the expiration of ten (10) years from the date of its grant or such shorter period specified in the Option Agreement.

(b) Exercise Price . Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, the exercise price of each Option shall be not less than one hundred percent (100%) of the Fair Market Value of the Common Stock subject to the Option on the date the Option is granted. Notwithstanding the foregoing, an Option may be granted with an exercise price lower than one hundred percent (100%) of the Fair Market Value of the Common Stock subject to the Option if such Option is granted pursuant to an assumption of or substitution for another option in a manner consistent with the provisions of Section 424(a) of the Code (whether or not such options are Incentive Stock Options).

(c) Consideration . The purchase price of Common Stock acquired pursuant to the exercise of an Option shall be paid, to the extent permitted by applicable law and as determined by the Board in its sole discretion, by any combination of the methods of payment set forth below. The Board shall have the authority to grant Options that do not permit all of the following methods of payment (or otherwise restrict the ability to use certain methods) and to grant Options that require the consent of the Company to utilize a particular method of payment. The methods of payment permitted by this Section 5(c) are:

(i) by cash, check, bank draft or money order payable to the Company;

(ii) pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of the stock subject to the Option, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds;

(iii) by delivery to the Company (either by actual delivery or attestation) of shares of Common Stock;

(iv) by a “net exercise” arrangement pursuant to which the Company will reduce the number of shares of Common Stock issued upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price; *provided, however*, that the Company shall accept a cash or other payment from the Participant to the extent of any remaining balance of the aggregate exercise price not satisfied by such reduction in the number of whole shares to be issued; *provided, further*, that shares of Common Stock will no longer be outstanding under an Option and will not be exercisable thereafter to the extent that (A) shares are used to pay the exercise price pursuant to the “net exercise,” (B) shares are delivered to the Participant as a result of such exercise, and (C) shares are withheld to satisfy tax withholding obligations; or

(v) in any other form of legal consideration that may be acceptable to the Board.

(d) Transferability of Options . The Board may, in its sole discretion, impose such limitations on the transferability of Options as the Board shall determine. In the absence of such a determination by the Board to the contrary, the following restrictions on the transferability of Options shall apply:

(i) Restrictions on Transfer . An Option shall not be transferable except by will or by the laws of descent and distribution and shall be exercisable during the lifetime of the Optionholder only by the Optionholder; *provided, however*, that the Board may, in its sole discretion, permit transfer of the Option in a manner consistent with applicable tax and securities laws upon the Optionholder’s request.

(ii) Domestic Relations Orders . Notwithstanding the foregoing, an Option may be transferred pursuant to a domestic relations order, *provided, however*, that an Incentive Stock Option may be deemed to be a Nonqualified Stock Option as a result of such transfer.

(iii) Beneficiary Designation . Notwithstanding the foregoing, the Optionholder may, by delivering written notice to the Company, in a form provided by or otherwise satisfactory to the Company, designate a third party who, in the event of the death of the Optionholder, shall thereafter be the beneficiary of an Option with the right to exercise the Option and receive the Common Stock or other consideration resulting from an Option exercise.

(e) Vesting Generally . The total number of shares of Common Stock subject to an Option may vest and therefore become exercisable in periodic installments that may or may not be equal. The Option may be subject to such other terms and conditions on the time or times when it may or may not be exercised (which may be based on the satisfaction of Performance Goals or other criteria) as the Board may deem appropriate. The vesting provisions of individual

Options may vary. The provisions of this Section 5(e) are subject to Section 2(g) and any Option provisions governing the minimum number of shares of Common Stock as to which an Option may be exercised.

(f) Termination of Continuous Service . Except as otherwise provided in the applicable Option Agreement or other agreement between the Optionholder and the Company, in the event that an Optionholder's Continuous Service terminates (other than upon the Optionholder's death or Disability), the Optionholder may exercise his or her Option (to the extent that the Optionholder was entitled to exercise such Option as of the date of termination of Continuous Service) but only within such period of time ending on the earlier of (i) the date three (3) months following the termination of the Optionholder's Continuous Service (or such longer or shorter period specified in the Option Agreement), or (ii) the expiration of the term of the Option as set forth in the Option Agreement. If, after termination of Continuous Service, the Optionholder does not exercise his or her Option within the time specified herein or in the Option Agreement (as applicable), the Option shall terminate.

(g) Extension of Termination Date . Unless otherwise provided in an Optionholder's Option Agreement, if the exercise of the Option following the termination of the Optionholder's Continuous Service would be prohibited at any time solely because the issuance of shares of Common Stock would violate the registration requirements under the Securities Act, then the Option shall terminate on the earlier of (i) the expiration of a period equal to the original post-termination exercise period applicable to such Award during which the exercise of the Option would not be in violation of such registration requirements, or (ii) the expiration of the term of the Option as set forth in the Option Agreement. In addition, unless otherwise provided in an Optionholder's Option Agreement, if the sale of the Common Stock received upon exercise of an Option following the termination of the Optionholder's Continuous Service would violate the Company's insider trading policy, then the Option shall terminate on the earlier of (i) the expiration of a period equal to the original post-termination exercise period applicable to such Award during which the exercise of the Option would not be in violation of the Company's insider trading policy, (ii) the 15th day of the third month after the date on which the Option would cease to be exercisable but for this Section 5(g), or such longer period as would not cause the Option to become subject to Section 409A(a)(1) of the Code; or (iii) the expiration of the term of the Option as set forth in the Option Agreement.

(h) Disability of Optionholder . In the event that an Optionholder's Continuous Service terminates as a result of the Optionholder's Disability, the Optionholder may exercise his or her Option (to the extent that the Optionholder was entitled to exercise such Option as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (i) the date twelve (12) months following such termination of Continuous Service (or such longer or shorter period specified in the Option Agreement), or (ii) the expiration of the term of the Option as set forth in the Option Agreement. If, after termination of Continuous Service, the Optionholder does not exercise his or her Option within the time specified herein or in the Option Agreement (as applicable), the Option shall terminate.

(i) Death of Optionholder . In the event that (i) an Optionholder's Continuous Service terminates as a result of the Optionholder's death, or (ii) the Optionholder dies within the period (if any) specified in the Option Agreement after the termination of the Optionholder's

Continuous Service for a reason other than death, then the Option may be exercised (to the extent the Optionholder was entitled to exercise such Option as of the date of death) by the Optionholder's estate, by a person who acquired the right to exercise the Option by bequest or inheritance or by a person designated as the beneficiary of the Option upon the Optionholder's death, but only within the period ending on the earlier of (A) the date eighteen (18) months following the date of death (or such longer or shorter period specified in the Option Agreement), or (B) the expiration of the term of such Option as set forth in the Option Agreement. If, after the Optionholder's death, the Option is not exercised within the time specified herein or in the Option Agreement (as applicable), the Option shall terminate. If the Optionholder designates a third party beneficiary of the Option in accordance with Section 5(d)(iii), then upon the death of the Optionholder such designated beneficiary shall have the sole right to exercise the Option and receive the Common Stock or other consideration resulting from an Option exercise.

(j) Non-Exempt Employees . No Option granted to an Employee who is a non-exempt employee for purposes of the Fair Labor Standards Act shall be first exercisable for any shares of Common Stock until at least six (6) months following the date of grant of the Option. The foregoing provision is intended to operate so that any income derived by a non-exempt employee in connection with the exercise or vesting of an Option will be exempt from his or her regular rate of pay.

6. PROVISIONS OF STOCK AWARDS OTHER THAN OPTIONS.

(a) Restricted Stock Awards . Each Restricted Stock Award Agreement shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. To the extent consistent with the Company's Bylaws, at the Board's election, shares of Common Stock may be (x) held in book entry form subject to the Company's instructions until any restrictions relating to the Restricted Stock Award lapse; or (y) evidenced by a certificate, which certificate shall be held in such form and manner as determined by the Board. The terms and conditions of Restricted Stock Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Award Agreements need not be identical; *provided, however* , that each Restricted Stock Award Agreement shall include (through incorporation of provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Consideration . A Restricted Stock Award may be awarded in consideration for (A) past or future services actually or to be rendered to the Company or an Affiliate, or (B) any other form of legal consideration that may be acceptable to the Board in its sole discretion and permissible under applicable law.

(ii) Vesting . Subject to Section 2(g), shares of Common Stock awarded under the Restricted Stock Award Agreement may be subject to forfeiture to the Company in accordance with a vesting schedule to be determined by the Board.

(iii) Termination of Participant's Continuous Service . In the event a Participant's Continuous Service terminates, the Company may receive via a forfeiture condition, any or all of the shares of Common Stock held by the Participant that have not vested

as of the date of termination of Continuous Service under the terms of the Restricted Stock Award Agreement.

(iv) Transferability . Rights to acquire shares of Common Stock under the Restricted Stock Award Agreement shall be transferable by the Participant only upon such terms and conditions as are set forth in the Restricted Stock Award Agreement, as the Board shall determine in its sole discretion, so long as Common Stock awarded under the Restricted Stock Award Agreement remains subject to the terms of the Restricted Stock Award Agreement.

(b) Restricted Stock Unit Awards . Each Restricted Stock Unit Award Agreement shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. The terms and conditions of Restricted Stock Unit Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Unit Award Agreements need not be identical; *provided, however* , that each Restricted Stock Unit Award Agreement shall include (through incorporation of the provisions hereof by reference in the Agreement or otherwise) the substance of each of the following provisions:

(i) Consideration . At the time of grant of a Restricted Stock Unit Award, the Board will determine the consideration, if any, to be paid by the Participant upon delivery of each share of Common Stock subject to the Restricted Stock Unit Award. The consideration to be paid (if any) by the Participant for each share of Common Stock subject to a Restricted Stock Unit Award may be paid in any form of legal consideration that may be acceptable to the Board in its sole discretion and permissible under applicable law.

(ii) Vesting . Subject to Section 2(g), at the time of the grant of a Restricted Stock Unit Award, the Board may impose such restrictions or conditions to the vesting of the Restricted Stock Unit Award as it, in its sole discretion, deems appropriate.

(iii) Payment . A Restricted Stock Unit Award may be settled by the delivery of shares of Common Stock, their cash equivalent, any combination thereof or in any other form of consideration, as determined by the Board and contained in the Restricted Stock Unit Award Agreement.

(iv) Additional Restrictions . At the time of the grant of a Restricted Stock Unit Award, the Board, as it deems appropriate, may impose such restrictions or conditions that delay the delivery of the shares of Common Stock (or their cash equivalent) subject to a Restricted Stock Unit Award to a time after the vesting of such Restricted Stock Unit Award.

(v) Termination of Participant's Continuous Service . Except as otherwise provided in the applicable Restricted Stock Unit Award Agreement, such portion of the Restricted Stock Unit Award that has not vested will be forfeited upon the Participant's termination of Continuous Service.

(vi) Compliance with Section 409A of the Code . Notwithstanding anything to the contrary set forth herein, any Restricted Stock Unit Award granted under the Plan that is not exempt from the requirements of Section 409A of the Code shall contain such provisions so that such Restricted Stock Unit Award will comply with the requirements of Section 409A of the

Code. Such restrictions, if any, shall be determined by the Board and contained in the Restricted Stock Unit Award Agreement evidencing such Restricted Stock Unit Award.

(c) Stock Appreciation Rights . Each Stock Appreciation Right Agreement shall be in such form and shall contain such terms and conditions as the Board shall deem appropriate. Stock Appreciation Rights may be granted as stand-alone Stock Awards or in tandem with other Stock Awards. The terms and conditions of Stock Appreciation Right Agreements may change from time to time, and the terms and conditions of separate Stock Appreciation Right Agreements need not be identical; *provided, however* , that each Stock Appreciation Right Agreement shall include (through incorporation of the provisions hereof by reference in the Agreement or otherwise) the substance of each of the following provisions:

(i) Term . No Stock Appreciation Right shall be exercisable after the expiration of ten (10) years from the date of its grant or such shorter period specified in the Stock Appreciation Right Agreement.

(ii) Strike Price . Each Stock Appreciation Right will be denominated in shares of Common Stock equivalents. The strike price of each Stock Appreciation Right shall not be less than one hundred percent (100%) of the Fair Market Value of the Common Stock equivalents subject to the Stock Appreciation Right on the date of grant.

(iii) Calculation of Appreciation . The appreciation distribution payable on the exercise of a Stock Appreciation Right will be not greater than an amount equal to the excess of (A) the aggregate Fair Market Value (on the date of the exercise of the Stock Appreciation Right) of a number of shares of Common Stock equal to the number of Common Stock equivalents in which the Participant is vested under such Stock Appreciation Right, and with respect to which the Participant is exercising the Stock Appreciation Right on such date, over (B) the strike price that will be determined by the Board at the time of grant of the Stock Appreciation Right.

(iv) Vesting . Subject to Section 2(g), at the time of the grant of a Stock Appreciation Right, the Board may impose such restrictions or conditions to the vesting of such Stock Appreciation Right as it, in its sole discretion, deems appropriate.

(v) Exercise . To exercise any outstanding Stock Appreciation Right, the Participant must provide written notice of exercise to the Company in compliance with the provisions of the Stock Appreciation Right Agreement evidencing such Stock Appreciation Right.

(vi) Payment . The appreciation distribution in respect to a Stock Appreciation Right may be paid in Common Stock, in cash, in any combination of the two or in any other form of consideration, as determined by the Board and contained in the Stock Appreciation Right Agreement evidencing such Stock Appreciation Right.

(vii) Termination of Continuous Service . In the event that a Participant's Continuous Service terminates, the Participant may exercise his or her Stock Appreciation Right (to the extent that the Participant was entitled to exercise such Stock Appreciation Right as of the date of termination) but only within such period of time ending on the earlier of (A) the date

three (3) months following the termination of the Participant's Continuous Service (or such longer or shorter period specified in the Stock Appreciation Right Agreement), or (B) the expiration of the term of the Stock Appreciation Right as set forth in the Stock Appreciation Right Agreement. If, after termination, the Participant does not exercise his or her Stock Appreciation Right within the time specified herein or in the Stock Appreciation Right Agreement (as applicable), the Stock Appreciation Right shall terminate.

(viii) Compliance with Section 409A of the Code . Notwithstanding anything to the contrary set forth herein, any Stock Appreciation Rights granted under the Plan that are not exempt from the requirements of Section 409A of the Code shall contain such provisions so that such Stock Appreciation Rights will comply with the requirements of Section 409A of the Code. Such restrictions, if any, shall be determined by the Board and contained in the Stock Appreciation Right Agreement evidencing such Stock Appreciation Right.

(d) Performance Awards .

(i) Performance Stock Awards . A Performance Stock Award is a Stock Award that may be granted, may vest, or may be exercised based upon the attainment during a Performance Period of certain Performance Goals. A Performance Stock Award may, but need not, require the completion of a specified period of Continuous Service. Subject to Section 2(g), the length of any Performance Period, the Performance Goals to be achieved during the Performance Period, and the measure of whether and to what degree such Performance Goals have been attained shall be conclusively determined by the Committee in its sole discretion. The maximum number of shares that may be granted to any Participant in a calendar year attributable to Stock Awards described in this Section 6(d)(i) shall not exceed five hundred thousand (500,000) shares of Common Stock. In addition, to the extent permitted by applicable law and the applicable Award Agreement, the Board may determine that cash may be used in payment of Performance Stock Awards.

(ii) Performance Cash Awards . A Performance Cash Award is a cash award that may be granted upon the attainment during a Performance Period of certain Performance Goals. A Performance Cash Award may also require the completion of a specified period of Continuous Service. Subject to Section 2(g), the length of any Performance Period, the Performance Goals to be achieved during the Performance Period, and the measure of whether and to what degree such Performance Goals have been attained shall be conclusively determined by the Committee in its sole discretion. The maximum value that may be granted to any Participant in a calendar year attributable to Performance Cash Awards described in this Section 6(d)(ii) shall not exceed one million dollars (\$1,000,000). The Board may provide for or, subject to such terms and conditions as the Board may specify, may permit a Participant to elect for, the payment of any Performance Cash Award to be deferred to a specified date or event. The Committee may specify the form of payment of Performance Cash Awards, which may be cash or other property, or may provide for a Participant to have the option for his or her Performance Cash Award, or such portion thereof as the Board may specify, to be paid in whole or in part in cash or other property. In addition, to the extent permitted by applicable law and the applicable Award Agreement, the Board may determine that Common Stock authorized under this Plan may be used in payment of Performance Cash Awards, including additional shares in excess of the Performance Cash Award as an inducement to hold shares of Common Stock.

(e) Other Stock Awards . Other forms of Stock Awards valued in whole or in part by reference to, or otherwise based on, Common Stock may be granted either alone or in addition to Stock Awards provided for under Section 5 and the preceding provisions of this Section 6. Subject to the provisions of the Plan (including, but not limited to, Section s 2(g) and 2(h)) , the Board shall have sole and complete authority to determine the persons to whom and the time or times at which such Other Stock Awards will be granted, the number of shares of Common Stock (or the cash equivalent thereof) to be granted pursuant to such Other Stock Awards and all other terms and conditions of such Other Stock Awards.

7. COVENANTS OF THE COMPANY .

(a) Availability of Shares . During the terms of the Stock Awards, the Company shall keep available at all times the number of shares of Common Stock reasonably required to satisfy such Stock Awards.

(b) Securities Law Compliance . The Company shall seek to obtain from each regulatory commission or agency having jurisdiction over the Plan such authority as may be required to grant Stock Awards and to issue and sell shares of Common Stock upon exercise of the Stock Awards; *provided, however* , that this undertaking shall not require the Company to register under the Securities Act the Plan, any Stock Award or any Common Stock issued or issuable pursuant to any such Stock Award. If, after reasonable efforts, the Company is unable to obtain from any such regulatory commission or agency the authority that counsel for the Company deems necessary for the lawful issuance and sale of Common Stock under the Plan, the Company shall be relieved from any liability for failure to issue and sell Common Stock upon exercise of such Stock Awards unless and until such authority is obtained.

(c) No Obligation to Notify . The Company shall have no duty or obligation to any holder of a Stock Award to advise such holder as to the time or manner of exercising such Stock Award. Furthermore, the Company shall have no duty or obligation to warn or otherwise advise such holder of a pending termination or expiration of a Stock Award or a possible period in which the Stock Award may not be exercised. The Company has no duty or obligation to minimize the tax consequences of a Stock Award to the holder of such Stock Award.

8. MISCELLANEOUS .

(a) Use of Proceeds from Sales of Common Stock . Proceeds from the sale of shares of Common Stock pursuant to Stock Awards shall constitute general funds of the Company.

(b) Corporate Action Constituting Grant of Stock Awards . Corporate action constituting a grant by the Company of a Stock Award to any Participant shall be deemed completed as of the date of such corporate action, unless otherwise determined by the Board, regardless of when the instrument, certificate, or letter evidencing the Stock Award is communicated to, or actually received or accepted by, the Participant.

(c) Stockholder Rights . No Participant shall be deemed to be the holder of, or to have any of the rights of a holder with respect to, any shares of Common Stock subject to such Stock Award unless and until such Participant has exercised the Stock Award pursuant to its

terms and the Participant shall not be deemed to be a stockholder of record until the issuance of the Common Stock pursuant to such exercise has been entered into the books and records of the Company.

(d) No Employment or Other Service Rights . Nothing in the Plan, any Stock Award Agreement or other instrument executed thereunder or in connection with any Award granted pursuant to the Plan shall confer upon any Participant any right to continue to serve the Company or an Affiliate in the capacity in effect at the time the Stock Award was granted or shall affect the right of the Company or an Affiliate to terminate (i) the employment of an Employee with or without notice and with or without cause, (ii) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate, or (iii) the service of a Director pursuant to the Bylaws of the Company or an Affiliate, and any applicable provisions of the corporate law of the state in which the Company or the Affiliate is incorporated, as the case may be.

(e) Incentive Stock Option \$100,000 Limitation . To the extent that the aggregate Fair Market Value (determined at the time of grant) of Common Stock with respect to which Incentive Stock Options are exercisable for the first time by any Optionholder during any calendar year (under all plans of the Company and any Affiliates) exceeds one hundred thousand dollars (\$100,000), the Options or portions thereof that exceed such limit (according to the order in which they were granted) shall be treated as Nonstatutory Stock Options, notwithstanding any contrary provision of the applicable Option Agreement(s).

(f) Investment Assurances . The Company may require a Participant, as a condition of exercising or acquiring Common Stock under any Stock Award, (i) to give written assurances satisfactory to the Company as to the Participant's knowledge and experience in financial and business matters and/or to employ a purchaser representative reasonably satisfactory to the Company who is knowledgeable and experienced in financial and business matters and that he or she is capable of evaluating, alone or together with the purchaser representative, the merits and risks of exercising the Stock Award; and (ii) to give written assurances satisfactory to the Company stating that the Participant is acquiring Common Stock subject to the Stock Award for the Participant's own account and not with any present intention of selling or otherwise distributing the Common Stock. The foregoing requirements, and any assurances given pursuant to such requirements, shall be inoperative if (A) the issuance of the shares upon the exercise or acquisition of Common Stock under the Stock Award has been registered under a then currently effective registration statement under the Securities Act, or (B) as to any particular requirement, a determination is made by counsel for the Company that such requirement need not be met in the circumstances under the then applicable securities laws. The Company may, upon advice of counsel to the Company, place legends on stock certificates issued under the Plan as such counsel deems necessary or appropriate in order to comply with applicable securities laws, including, but not limited to, legends restricting the transfer of the Common Stock.

(g) Withholding Obligations . Unless prohibited by the terms of a Stock Award Agreement, the Company may, in its sole discretion, satisfy any federal, state or local tax withholding obligation relating to an Award by any of the following means (in addition to the Company's right to withhold from any compensation paid to the Participant by the Company) or by a combination of such means: (i) causing the Participant to tender a cash payment; (ii)

withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to the Participant in connection with the Award; (iii) withholding cash from an Award settled in cash; or (iv) by such other method as may be set forth in the Award Agreement.

(h) Electronic Delivery . Any reference herein to a “written” agreement or document shall include any agreement or document delivered electronically or posted on the Company’s intranet.

(i) Deferrals . To the extent permitted by applicable law, the Board, in its sole discretion, may determine that the delivery of Common Stock or the payment of cash, upon the exercise, vesting or settlement of all or a portion of any Award may be deferred and may establish programs and procedures for deferral elections to be made by Participants. Deferrals by Participants will be made in accordance with Section 409A of the Code. Consistent with Section 409A of the Code, the Board may provide for distributions while a Participant is still an employee. The Board is authorized to make deferrals of Stock Awards and determine when, and in what annual percentages, Participants may receive payments, including lump sum payments, following the Participant’s termination of employment or retirement, and implement such other terms and conditions consistent with the provisions of the Plan and in accordance with applicable law.

(j) Compliance with Section 409A of the Code . To the extent that the Board determines that any Award granted under the Plan is subject to Section 409A of the Code, the Award Agreement evidencing such Award shall incorporate the terms and conditions necessary to avoid the consequences specified in Section 409A(a)(1) of the Code. To the extent applicable, the Plan and Award Agreements shall be interpreted in accordance with Section 409A of the Code and Department of Treasury regulations and other interpretive guidance issued thereunder, including without limitation any such regulations or other guidance that may be issued or amended after the Effective Date. Notwithstanding any provision of the Plan to the contrary, in the event that following the Effective Date the Board determines that any Award may be subject to Section 409A of the Code and related Department of Treasury guidance (including such Department of Treasury guidance as may be issued after the Effective Date), the Board may adopt such amendments to the Plan and the applicable Award Agreement or adopt other policies and procedures (including amendments, policies and procedures with retroactive effect), or take any other actions, that the Board determines are necessary or appropriate to (i) exempt the Award from Section 409A of the Code and/or preserve the intended tax treatment of the benefits provided with respect to the Award, or (ii) comply with the requirements of Section 409A of the Code and Department of Treasury regulations and other interpretive guidance issued thereunder, including without limitation any such regulations or other guidance that may be issued or amended after the Effective Date.

9. ADJUSTMENTS UPON CHANGES IN COMMON STOCK; OTHER CORPORATE EVENTS.

(a) Capitalization Adjustments . In the event of a Capitalization Adjustment, the Board shall appropriately adjust: (i) the class(es) and maximum number of securities subject to the Plan pursuant to Section 3(a), (ii) the class(es) and maximum number of securities that may be issued pursuant to the exercise of Incentive Stock Options pursuant to Section 3(d), (iii) the class(es) and maximum number of securities that may be awarded to any person pursuant to

Section 3(e) and 6(d)(i), and (iv) the class(es) and number of securities and price per share of stock subject to outstanding Stock Awards. The Board shall make such adjustments, and its determination shall be final, binding and conclusive.

(b) Dissolution or Liquidation . Except as otherwise provided in the Stock Award Agreement, in the event of a dissolution or liquidation of the Company, all outstanding Stock Awards (other than Stock Awards consisting of vested and outstanding shares of Common Stock not subject to the Company's right of repurchase) shall terminate immediately prior to the completion of such dissolution or liquidation, and the shares of Common Stock subject to the Company's repurchase option may be repurchased by the Company notwithstanding the fact that the holder of such Stock Award is providing Continuous Service.

(c) Transactions . The provisions of this Section 9(c) shall apply to each outstanding Stock Award in the event of a Transaction unless otherwise provided in the instrument evidencing the Stock Award, in any other written agreement between the Company or any Affiliate and the Participant, or in any director compensation policy of the Company.

(i) Stock Awards May Be Assumed . In the event of a Transaction, any surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) may assume or continue any or all outstanding Stock Awards or may substitute similar stock awards for any or all outstanding Stock Awards (including, but not limited to, awards to acquire the same consideration paid to the stockholders of the Company pursuant to the Transaction), and any reacquisition or repurchase rights held by the Company in respect of Common Stock issued pursuant to any outstanding Stock Awards may be assigned by the Company to the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company). For clarity, in the event of a Transaction, any surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) may choose to assume or continue only a portion of an outstanding Stock Award, to substitute a similar stock award for only a portion of an outstanding Stock Award, or to assume or continue, or substitute similar stock awards for, the outstanding Stock Awards held by some, but not all, Participants. The terms of any such assumption, continuation or substitution shall be set by the Board.

(ii) Stock Awards Held by Current Participants . In the event of a Transaction in which the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) does not assume or continue outstanding Stock Awards, or substitute similar stock awards for outstanding Stock Awards, then with respect to any such Stock Awards that have not been assumed, continued or substituted and that are held by Participants whose Continuous Service has not terminated prior to the effective time of the Transaction (referred to as the "***Current Participants***"), the vesting (and exercisability, if applicable) of such Stock Awards shall be accelerated in full (and with respect to Performance Stock Awards, vesting shall be deemed to be satisfied at the greater of (x) the target level of performance or (y) the actual level of performance measured in accordance with the applicable Performance Goals as of the date of the Transaction) to a date prior to the effective time of the Transaction (contingent upon the closing or completion of the Transaction) as the Board shall determine (or, if the Board does not determine such a date, to the date that is five (5) days prior to the effective time of the Transaction), and such Stock Awards shall terminate if not exercised

(if applicable) prior to the effective time of the Transaction in accordance with the exercise procedures determined by the Board, and any reacquisition or repurchase rights held by the Company with respect to such Stock Awards shall lapse (contingent upon the closing or completion of the Transaction) .

(iii) Stock Awards Held by Participants other than Current Participants . In the event of a Transaction in which the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) does not assume or continue outstanding Stock Awards, or substitute similar stock awards for outstanding Stock Awards, then with respect to any such Stock Awards that have not been assumed, continued or substituted and that are held by Participants other than Current Participants, such Stock Awards shall terminate if not exercised (if applicable) prior to the effective time of the Transaction in accordance with the exercise procedures determined by the Board; *provided, however* , that any reacquisition or repurchase rights held by the Company with respect to such Stock Awards shall not terminate and may continue to be exercised notwithstanding the Transaction.

(iv) Payment for Stock Awards in Lieu of Exercise . Notwithstanding the foregoing, in the event any outstanding Stock Award held by a Participant will terminate if not exercised prior to the effective time of a Transaction, the Board may provide that the Participant may not exercise such Stock Award but instead will receive a payment, in such form as may be determined by the Board, equal in value to the excess, if any, of (A) the value of the property the Participant would have received upon the exercise of such Stock Award immediately prior to the effective time of the Transaction, over (B) any exercise price payable by the Participant in connection with such exercise. For clarity, such payment may be zero if the value of such property is equal to or less than the exercise price. Payments under this provision may be delayed to the same extent that payment of consideration to the holders of the Common Stock in connection with the Transaction is delayed as a result of escrows, earn outs, holdbacks or any other contingencies.

(d) Change in Control . Unless provided otherwise in the Stock Award Agreement for a Stock Award, in any other written agreement or plan between the Company or any Affiliate and the Participant, or in any director compensation policy of the Company, a Stock Award will not be subject to additional acceleration of vesting and exercisability upon or after a Change in Control.

10. TERMINATION OR SUSPENSION OF THE PLAN.

(a) Plan Term . Unless sooner terminated by the Board pursuant to Section 2, the Plan shall automatically terminate on April 21, 2023. No Awards may be granted under the Plan while the Plan is suspended or after it is terminated.

(b) No Impairment of Rights . Termination of the Plan shall not impair rights and obligations under any Award granted while the Plan is in effect except with the written consent of the affected Participant.

11. EFFECTIVE DATE OF PLAN.

This Plan originally became effective on the Effective Date. This amendment and restatement of the Plan is effective June 5, 2019.

12. CHOICE OF LAW.

The law of the State of California shall govern all questions concerning the construction, validity and interpretation of this Plan, without regard to such state's conflict of laws rules.

13. DEFINITIONS. AS used in the Plan, the definitions contained in this Section 13 shall apply to the capitalized terms indicated below:

(a) “ *Affiliate* ” means, at the time of determination, any “parent” or “subsidiary” of the Company as such terms are defined in Rule 405 of the Securities Act. The Board shall have the authority to determine the time or times at which “parent” or “subsidiary” status is determined within the foregoing definition.

(b) “ *Appreciation Award* ” means (i) a stock option or stock appreciation right granted under either of the Prior Plans or the Inducement Plan or (ii) an Option or Stock Appreciation Right, in each case with respect to which the exercise or strike price is at least one hundred percent (100%) of the Fair Market Value of the Common Stock subject to the stock option or stock appreciation right, or Option or Stock Appreciation Right, as applicable, on the date of grant.

(c) “ *Award* ” means a Stock Award or a Performance Cash Award.

(d) “ *Award Agreement* ” means a written agreement between the Company and a Participant evidencing the terms and conditions of an Award.

(e) “ *Board* ” means the Board of Directors of the Company.

(f) “ *Capitalization Adjustment* ” means any change that is made in, or other events that occur with respect to, the Common Stock subject to the Plan or subject to any Stock Award after the Effective Date without the receipt of consideration by the Company (through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or other transaction not involving the receipt of consideration by the Company). Notwithstanding the foregoing, the conversion of any convertible securities of the Company shall not be treated as a transaction “without receipt of consideration” by the Company.

(g) “ *Cause* ” means with respect to a Participant, the occurrence of any of the following events: (i) such Participant's commission of any felony or any crime involving fraud, dishonesty or moral turpitude under the laws of the United States or any state thereof; (ii) such Participant's attempted commission of, or participation in, a fraud or act of dishonesty against the Company; (iii) such Participant's intentional, material violation of any contract or agreement between the Participant and the Company or of any statutory duty owed to the Company; (iv) such Participant's unauthorized use or disclosure of the Company's confidential information or trade secrets; or (v) such Participant's gross misconduct. The determination that a termination of

the Participant's Continuous Service is either for Cause or without Cause shall be made by the Company in its sole discretion. Any determination by the Company that the Continuous Service of a Participant was terminated by reason of dismissal without Cause for the purposes of outstanding Awards held by such Participant shall have no effect upon any determination of the rights or obligations of the Company or such Participant for any other purpose.

(h) “ *Change in Control* ” means the occurrence, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) any Exchange Act Person becomes the Owner, directly or indirectly, of securities of the Company representing more than fifty percent (50%) of the combined voting power of the Company's then outstanding securities other than by virtue of a merger, consolidation or similar transaction . Notwithstanding the foregoing, a Change in Control shall not be deemed to occur (A) on account of the acquisition of securities of the Company by an investor, any affiliate thereof or any other Exchange Act Person from the Company in a transaction or series of related transactions the primary purpose of which is to obtain financing for the Company through the issuance of equity securities or (B) solely because the level of Ownership held by any Exchange Act Person (the “ *Subject Person* ”) exceeds the designated percentage threshold of the outstanding voting securities as a result of a repurchase or other acquisition of voting securities by the Company reducing the number of shares outstanding, provided that if a Change in Control would occur (but for the operation of this sentence) as a result of the acquisition of voting securities by the Company, and after such share acquisition, the Subject Person becomes the Owner of any additional voting securities that, assuming the repurchase or other acquisition had not occurred, increases the percentage of the then outstanding voting securities Owned by the Subject Person over the designated percentage threshold, then a Change in Control shall be deemed to occur;

(ii) there is consummated a merger, consolidation or similar transaction involving (directly or indirectly) the Company and, immediately after the consummation of such merger, consolidation or similar transaction, the stockholders of the Company immediately prior thereto do not Own, directly or indirectly, either (A) outstanding voting securities representing more than fifty percent (50%) of the combined outstanding voting power of the surviving Entity in such merger, consolidation or similar transaction or (B) more than fifty percent (50%) of the combined outstanding voting power of the parent of the surviving Entity in such merger, consolidation or similar transaction, in each case in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such transaction;

(iii) there is consummated a sale, lease, exclusive license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries, other than a sale, lease, license or other disposition of all or substantially all of the consolidated assets of the Company and its Subsidiaries to an Entity, more than fifty percent (50%) of the combined voting power of the voting securities of which are Owned by stockholders of the Company in substantially the same proportions as their Ownership of the outstanding voting securities of the Company immediately prior to such sale, lease, license or other disposition; or

(iv) individuals who, on the date this Plan is adopted by the Board, are members of the Board (the “Incumbent Board”) cease for any reason to constitute at least a majority of the members of the Board; *provided, however* , that if the appointment or election (or nomination for election) of any new Board member was approved or recommended by a majority vote of the members of the Incumbent Board then still in office, such new member shall, for purposes of this Plan, be considered as a member of the Incumbent Board.

For clarity, the term Change in Control shall not include a sale of assets, merger or other transaction effected exclusively for the purpose of changing the domicile of the Company.

Notwithstanding the foregoing or any other provision of this Plan, the definition of Change in Control (or any analogous term) in an individual written agreement between the Company or any Affiliate and the Participant shall supersede the foregoing definition with respect to Awards subject to such agreement; *provided, however* , that (x) if no definition of Change in Control or any analogous term is set forth in such an individual written agreement, the foregoing definition shall apply, and (y) no Change in Control (or any analogous term) will be deemed to occur with respect to Awards subject to such an individual written agreement without a requirement that the Change in Control (or any analogous term) actually occur.

(i) “ *Code* ” means the Internal Revenue Code of 1986, as amended.

(j) “ *Committee* ” means a committee of one (1) or more Directors to whom authority has been delegated by the Board in accordance with Section 2(c).

(k) “ *Common Stock* ” means the common stock of the Company.

(l) “ *Company* ” means Cerus Corporation, a Delaware corporation.

(m) “ *Consultant* ” means any person, including an advisor, who is (i) engaged by the Company or an Affiliate to render consulting or advisory services and is compensated for such services, or (ii) serving as a member of the board of directors of an Affiliate and is compensated for such services. However, service solely as a Director, or payment of a fee for such service, shall not cause a Director to be considered a “Consultant” for purposes of the Plan.

(n) “ *Continuous Service* ” means that the Participant’s service with the Company or an Affiliate, whether as an Employee, Director or Consultant, is not interrupted or terminated. A change in the capacity in which the Participant renders service to the Company or an Affiliate as an Employee, Consultant or Director or a change in the entity for which the Participant renders such service, provided that there is no interruption or termination of the Participant’s service with the Company or an Affiliate, shall not terminate a Participant’s Continuous Service. For example, a change in status from an employee of the Company to a consultant to an Affiliate or to a Director shall not constitute an interruption of Continuous Service. To the extent permitted by law, the Board or the chief executive officer of the Company, in that party’s sole discretion, may determine whether Continuous Service shall be considered interrupted in the case of any leave of absence approved by that party, including sick leave, military leave or any other personal leave. Notwithstanding the foregoing, a leave of absence shall be treated as Continuous Service for purposes of vesting in a Stock Award only to such extent as may be provided in the

Company's leave of absence policy, in the written terms of any leave of absence agreement or policy applicable to the Participant, or as otherwise required by law.

(o) “ **Corporate Transaction** ” means the occurrence, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) a sale or other disposition of all or substantially all, as determined by the Board in its sole discretion, of the consolidated assets of the Company and its Subsidiaries;

(ii) a sale or other disposition of at least ninety percent (90%) of the outstanding securities of the Company;

(iii) the consummation of a merger, consolidation or similar transaction following which the Company is not the surviving corporation; or

(iv) the consummation of a merger, consolidation or similar transaction following which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger, consolidation or similar transaction are converted or exchanged by virtue of the merger, consolidation or similar transaction into other property, whether in the form of securities, cash or otherwise.

(p) “ **Covered Employee** ” shall have the meaning provided in Section 162(m)(3) of the Code and the regulations promulgated thereunder.

(q) “ **Director** ” means a member of the Board.

(r) “ **Disability** ” means, with respect to a Participant, the inability of such Participant to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, as provided in Section 22(e)(3) and 409A(a)(2)(c)(i) of the Code.

(s) “ **Effective Date** ” means the original effective date of this Plan document, which is the date of the annual meeting of stockholders of the Company held in 2008. This restatement of the Plan document is effective on June 5, 2019, the date of the annual meeting of the stockholders of the Company held in 2019.

(t) “ **Employee** ” means any person employed by the Company or an Affiliate. However, service solely as a Director, or payment of a fee for such services, shall not cause a Director to be considered an “Employee” for purposes of the Plan.

(u) “ **Entity** ” means a corporation, partnership, limited liability company or other entity.

(v) “ **Exchange Act** ” means the Securities Exchange Act of 1934, as amended.

(w) “ **Exchange Act Person** ” means any natural person, Entity or “group” (within the meaning of Section 13(d) or 14(d) of the Exchange Act), except that “Exchange Act Person”

shall not include (i) the Company or any Subsidiary of the Company, (ii) any employee benefit plan of the Company or any Subsidiary of the Company or any trustee or other fiduciary holding securities under an employee benefit plan of the Company or any Subsidiary of the Company, (iii) an underwriter temporarily holding securities pursuant to an offering of such securities, (iv) an Entity Owned, directly or indirectly, by the stockholders of the Company in substantially the same proportions as their Ownership of stock of the Company; or (v) any natural person, Entity or “group” (within the meaning of Section 13(d) or 14(d) of the Exchange Act) that, as of the Effective Date of the Plan as set forth in Section 11, is the Owner, directly or indirectly, of securities of the Company representing more than fifty percent (50%) of the combined voting power of the Company’s then outstanding securities.

(x) “ **Fair Market Value** ” means, as of any date, the value of the Common Stock determined as follows:

(i) If the Common Stock is listed on any established stock exchange or traded on any established market, the Fair Market Value of a share of Common Stock shall be the closing sales price for such stock (or the closing bid, if no sales were reported) as quoted on such exchange or market (or the exchange or market with the greatest volume of trading in the Common Stock) on the date of determination, as reported in *The Wall Street Journal* or such other source as the Board deems reliable. Unless otherwise provided by the Board, if there is no closing sales price (or closing bid if no sales were reported) for the Common Stock on the date of determination, then the Fair Market Value shall be the closing selling price (or closing bid if no sales were reported) on the last preceding date for which such quotation exists.

(ii) In the absence of such markets for the Common Stock, the Fair Market Value shall be determined by the Board in good faith.

(y) “ **Full Value Award** ” means (i) a stock award granted under either of the Prior Plans or the Inducement Plan or (ii) a Stock Award, in each case that is not an Appreciation Award.

(z) “ **Incentive Stock Option** ” means an option granted pursuant to Section 5 of the Plan that is intended to be, and qualifies as, an “incentive stock option” within the meaning of Section 422 of the Code and the regulations promulgated thereunder.

(aa) “ **Non-Employee Director** ” means a Director who either (i) is not a current employee or officer of the Company or an Affiliate, does not receive compensation, either directly or indirectly, from the Company or an Affiliate for services rendered as a consultant or in any capacity other than as a Director (except for an amount as to which disclosure would not be required under Item 404(a) of Regulation S-K promulgated pursuant to the Securities Act (“ **Regulation S-K** ”)), does not possess an interest in any other transaction for which disclosure would be required under Item 404(a) of Regulation S-K, and is not engaged in a business relationship for which disclosure would be required pursuant to Item 404(b) of Regulation S-K; or (ii) is otherwise considered a “non-employee director” for purposes of Rule 16b-3.

(bb) “ **Nonstatutory Stock Option** ” means any option granted pursuant to Section 5 of the Plan that does not qualify as an Incentive Stock Option.

(cc) “ **Officer** ” means a person who is an officer of the Company within the meaning of Section 16 of the Exchange Act and the rules and regulations promulgated thereunder.

(dd) “ **Option** ” means an Incentive Stock Option or a Nonstatutory Stock Option to purchase shares of Common Stock granted pursuant to the Plan.

(ee) “ **Option Agreement** ” means a written agreement between the Company and an Optionholder evidencing the terms and conditions of an Option grant. Each Option Agreement shall be subject to the terms and conditions of the Plan.

(ff) “ **Optionholder** ” means a person to whom an Option is granted pursuant to the Plan or, if permitted under the terms of this Plan, such other person who holds an outstanding Option.

(gg) “ **Other Stock Award** ” means an award based in whole or in part by reference to the Common Stock which is granted pursuant to the terms and conditions of Section 6(e).

(hh) “ **Other Stock Award Agreement** ” means a written agreement between the Company and a holder of an Other Stock Award evidencing the terms and conditions of an Other Stock Award grant. Each Other Stock Award Agreement shall be subject to the terms and conditions of the Plan.

(ii) “ **Outside Director** ” means a Director who either (i) is not a current employee of the Company or an “affiliated corporation” (within the meaning of Treasury Regulations promulgated under Section 162(m) of the Code), is not a former employee of the Company or an “affiliated corporation” who receives compensation for prior services (other than benefits under a tax-qualified retirement plan) during the taxable year, has not been an officer of the Company or an “affiliated corporation,” and does not receive remuneration from the Company or an “affiliated corporation,” either directly or indirectly, in any capacity other than as a Director, or (ii) is otherwise considered an “outside director” for purposes of Section 162(m) of the Code.

(jj) “ **Own,** ” “ **Owned,** ” “ **Owner,** ” “ **Ownership** ” A person or Entity shall be deemed to “Own,” to have “Owned,” to be the “Owner” of, or to have acquired “Ownership” of securities if such person or Entity, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares voting power, which includes the power to vote or to direct the voting, with respect to such securities.

(kk) “ **Participant** ” means a person to whom an Award is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Stock Award.

(ll) “ **Performance Cash Award** ” means an award of cash granted pursuant to the terms and conditions of Section 6(d)(ii).

(mm) “ **Performance Criteria** ” means the one or more criteria that the Board shall select for purposes of establishing the Performance Goals for a Performance Period. The Performance Criteria that shall be used to establish such Performance Goals may be based on any one of, or combination of, the following: (i) earnings per share; (ii) earnings before interest, taxes and depreciation; (iii) earnings before interest, taxes, depreciation and amortization; (iv) total

stockholder return; (v) return on equity; (vi) return on assets, investment, or capital employed; (vii) operating margin; (viii) gross margin; (ix) operating income; (x) net income (before or after taxes); (xi) net operating income; (xii) net operating income after tax; (xiii) pre-tax profit; (xiv) operating cash flow; (xv) sales or revenue targets; (xvi) increases in revenue or product revenue; (xvii) expenses and cost reduction goals; (xviii) improvement in or attainment of working capital levels; (xix) economic value added (or an equivalent metric); (xx) market share; (xxi) cash flow; (xxii) cash flow per share; (xxiii) share price performance; (xxiv) debt reduction; (xxv) implementation or completion of projects or processes; (xxvi) customer satisfaction; (xxvii) stockholders' equity; and (xxviii) to the extent that an Award is not intended to comply with Section 162(m) of the Code, other measures of performance selected by the Board. Partial achievement of the specified criteria may result in the payment or vesting corresponding to the degree of achievement as specified in the Stock Award Agreement or the written terms of a Performance Cash Award. The Board shall, in its sole discretion, define the manner of calculating the Performance Criteria it selects to use for such Performance Period.

(nn) “ *Performance Goals* ” means, for a Performance Period, the one or more goals established by the Board for the Performance Period based upon the Performance Criteria. Performance Goals may be based on a Company-wide basis, with respect to one or more business units, divisions, Affiliates, or business segments, and in either absolute terms or relative to the performance of one or more comparable companies or the performance of one or more relevant indices. At the time of the grant of any Award, the Board is authorized to determine whether, when calculating the attainment of Performance Goals for a Performance Period: (i) to exclude restructuring and/or other nonrecurring charges; (ii) to exclude exchange rate effects, as applicable, for non-U.S. dollar denominated net sales and operating earnings; (iii) to exclude the effects of changes to generally accepted accounting standards required by the Financial Accounting Standards Board; (iv) to exclude the effects of any statutory adjustments to corporate tax rates; and (v) to exclude the effects of any “extraordinary items” as determined under generally accepted accounting principles. In addition, the Board retains the discretion to reduce or eliminate the compensation or economic benefit due upon attainment of Performance Goals.

(oo) “ *Performance Period* ” means the period of time selected by the Board over which the attainment of one or more Performance Goals will be measured for the purpose of determining a Participant's right to and the payment of a Stock Award or a Performance Cash Award. Performance Periods may be of varying and overlapping duration, at the sole discretion of the Board.

(pp) “ *Performance Stock Award* ” means a Stock Award granted under the terms and conditions of Section 6(d)(i).

(qq) “ *Plan* ” means this Cerus Corporation 2008 Equity Incentive Plan.

(rr) “ *Restricted Stock Award* ” means an award of shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(a).

(ss) “ *Restricted Stock Award Agreement* ” means a written agreement between the Company and a holder of a Restricted Stock Award evidencing the terms and conditions of a

Restricted Stock Award grant. Each Restricted Stock Award Agreement shall be subject to the terms and conditions of the Plan.

(tt) “ **Restricted Stock Unit Award** ” means a right to receive shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(b).

(uu) “ **Restricted Stock Unit Award Agreement** ” means a written agreement between the Company and a holder of a Restricted Stock Unit Award evidencing the terms and conditions of a Restricted Stock Unit Award grant. Each Restricted Stock Unit Award Agreement shall be subject to the terms and conditions of the Plan.

(vv) “ **Rule 16b-3** ” means Rule 16b-3 promulgated under the Exchange Act or any successor to Rule 16b-3, as in effect from time to time.

(ww) “ **Securities Act** ” means the Securities Act of 1933, as amended.

(xx) “ **Stock Appreciation Right** ” means a right to receive the appreciation on Common Stock that is granted pursuant to the terms and conditions of Section 6(c).

(yy) “ **Stock Appreciation Right Agreement** ” means a written agreement between the Company and a holder of a Stock Appreciation Right evidencing the terms and conditions of a Stock Appreciation Right grant. Each Stock Appreciation Right Agreement shall be subject to the terms and conditions of the Plan.

(zz) “ **Stock Award** ” means any right to receive Common Stock granted under the Plan, including an Incentive Stock Option, a Nonstatutory Stock Option, a Restricted Stock Award, a Restricted Stock Unit Award, a Stock Appreciation Right, a Performance Stock Award or any Other Stock Award.

(aaa) “ **Stock Award Agreement** ” means a written agreement between the Company and a Participant evidencing the terms and conditions of a Stock Award grant. Each Stock Award Agreement shall be subject to the terms and conditions of the Plan.

(bbb) “ **Subsidiary** ” means, with respect to the Company, (i) any corporation of which more than fifty percent (50%) of the outstanding capital stock having ordinary voting power to elect a majority of the board of directors of such corporation (irrespective of whether, at the time, stock of any other class or classes of such corporation shall have or might have voting power by reason of the happening of any contingency) is at the time, directly or indirectly, Owned by the Company, and (ii) any partnership, limited liability company or other entity in which the Company has a direct or indirect interest (whether in the form of voting or participation in profits or capital) of more than fifty percent (50%).

(ccc) “ **Ten Percent Stockholder** ” means a person who Owns (or is deemed to Own pursuant to Section 424(d) of the Code) stock possessing more than ten percent (10%) of the total combined voting power of all classes of stock of the Company or any Affiliate.

(ddd) “ **Transaction** ” means a Corporate Transaction or a Change in Control.

CERTIFICATION

I, William M. Greenman, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Cerus Corporation;
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: August 1, 2019

/s/ William M. Greenman

William M. Greenman
President and Chief Executive Officer
(Principal Executive Officer)

CERTIFICATION

I, Kevin D. Green, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Cerus Corporation;
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: August 1, 2019

/s/ Kevin D. Green

Kevin D. Green
Vice President, Finance and Chief Financial Officer
(Principal Financial Officer)

CERTIFICATION

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, (the “Exchange Act”) and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. §1350), William M. Greenman, the Chief Executive Officer of Cerus Corporation (the “Company”) and Kevin D. Green, the Chief Financial Officer of the Company, hereby certify that, to the best of their knowledge:

1. The Company’s Quarterly Report on Form 10-Q for the period ended June 30, 2019, to which this Certification is attached as Exhibit 32.1 (the “Periodic Report”), fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act, and
2. The information contained in the Periodic Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

IN WITNESS WHEREOF, the undersigned have set their hands hereto as of the 1st day of August, 2019.

/s/ William M. Greenman

William M. Greenman

President and Chief Executive Officer (Principal Executive Officer)

/s/ Kevin D. Green

Kevin D. Green

Vice President, Finance and Chief Financial Officer (Principal Financial Officer)

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 Cerus Corporation 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.