
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 10-Q

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

For the quarterly period ended June 30, 2018

OR

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

For the transition period from _____ to _____

Commission File Number 000-14656

REPLIGEN CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

41 Seyon Street, Bldg. 1, Suite 100
Waltham, MA
(Address of principal executive offices)

04-2729386
(I.R.S. Employer
Identification No.)

02453
(Zip Code)

Registrant's telephone number, including area code: (781) 250-0111

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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. (Check one):

Large accelerated filer ☒

Accelerated filer ☐

Non-accelerated filer ☐ (Do not check if a smaller reporting company)

Smaller reporting company ☐

Emerging growth company ☐

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

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

Indicate the number of shares outstanding of each of the issuer’s classes of common stock, as of July 26, 2018.

<u>Class</u>	<u>Number of Shares</u>
Common Stock, par value \$.01 per share	43,805,802

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REPLIGEN CORPORATION
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited)

(in thousands, except share data)	<u>June 30, 2018</u>	<u>December 31, 2017</u>
Assets		
Current assets:		
Cash and cash equivalents	\$ 175,611	\$ 173,759
Accounts receivable, less reserve for doubtful accounts of \$61 at June 30, 2018 and \$58 at December 31, 2017, respectively	31,713	27,585
Royalties and other receivables	17	153
Inventories, net	40,948	39,004
Prepaid expenses and other current assets	4,620	2,281
Total current assets	252,909	242,782
Property, plant and equipment, net	23,993	22,417
Intangible assets, net	139,182	144,753
Goodwill	327,095	327,333
Other assets	1,902	6,234
Total assets	<u>\$ 745,081</u>	<u>\$ 743,519</u>
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	\$ 6,688	\$ 7,282
Accrued liabilities	13,102	17,929
Convertible senior notes, current portion	101,329	—
Total current liabilities	121,119	25,211
Convertible senior notes, net	—	99,250
Deferred tax liabilities	20,643	25,167
Other long-term liabilities	4,660	2,343
Commitments and contingencies (Note 14)		
Stockholders' equity:		
Preferred stock, \$.01 par value, 5,000,000 shares authorized, no shares issued or outstanding	—	—
Common stock, \$.01 par value, 80,000,000 shares authorized, 43,798,572 shares at June 30, 2018 and 43,587,079 shares at December 31, 2017 issued and outstanding	438	436
Additional paid-in capital	635,364	628,983
Accumulated other comprehensive loss	(11,143)	(6,363)
Accumulated deficit	(26,000)	(31,508)
Total stockholders' equity	598,659	591,548
Total liabilities and stockholders' equity	<u>\$ 745,081</u>	<u>\$ 743,519</u>

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

REPLIGEN CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(Unaudited)

(in thousands, except share and per share data)	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Revenue:				
Product revenue	\$ 47,743	\$ 32,434	\$ 92,542	\$ 63,003
Royalty and other revenue	(12)	21	19	42
Total revenue	47,731	32,455	92,561	63,045
Operating expenses:				
Cost of product revenue	21,088	13,937	40,756	27,926
Research and development	5,780	1,860	9,068	3,602
Selling, general and administrative	16,590	11,185	32,488	20,367
Total operating expenses	43,458	26,982	82,312	51,895
Income from operations	4,273	5,473	10,249	11,150
Investment income	512	110	693	206
Interest expense	(1,669)	(1,601)	(3,321)	(3,187)
Other income (expense)	251	(328)	321	(448)
Income before income taxes	3,367	3,654	7,942	7,721
Income tax (benefit) provision	629	(4,784)	1,757	(3,785)
Net income	\$ 2,738	\$ 8,438	\$ 6,185	\$ 11,506
Earnings per share:				
Basic	\$ 0.06	\$ 0.25	\$ 0.14	\$ 0.34
Diluted	\$ 0.06	\$ 0.24	\$ 0.14	\$ 0.33
Weighted average shares outstanding:				
Basic	43,743,356	34,097,805	43,682,650	33,995,323
Diluted	45,015,720	35,094,814	44,694,745	34,715,797
Other comprehensive income:				
Unrealized gain on investments	—	—	—	5
Foreign currency translation (loss) gain	(5,031)	4,046	(4,780)	5,073
Comprehensive (loss) income	\$ (2,293)	\$ 12,484	\$ 1,405	\$ 16,584

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

REPLIGEN CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited)

(In thousands)	Six months ended June 30,	
	2018	2017
Cash flows from operating activities:		
Net income	\$ 6,185	\$ 11,506
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	7,894	3,278
Non-cash interest expense	2,089	1,956
Stock-based compensation expense	4,893	3,027
Deferred tax expense	325	(5,384)
Loss on conversion of convertible senior notes	1	—
Loss on disposal of assets	—	64
Changes in assets and liabilities:		
Accounts receivable	(4,788)	(6,347)
Other receivables	60	226
Inventories	(3,096)	(813)
Prepaid expenses and other current assets	(144)	(236)
Other assets	(1,241)	(754)
Accounts payable	(701)	1,740
Accrued liabilities	(3,985)	(4,216)
Long-term liabilities	43	(86)
Net cash provided by operating activities	<u>7,535</u>	<u>3,961</u>
Cash flows from investing activities:		
Purchases of marketable securities	—	(42)
Redemptions of marketable securities	—	16,850
Purchases of property, plant and equipment	(4,412)	(2,676)
Net cash (used in) provided by investing activities	<u>(4,412)</u>	<u>14,132</u>
Cash flows from financing activities:		
Exercise of stock options	1,490	1,505
Repayment of senior convertible notes	(11)	—
Payment of contingent consideration	—	(1,677)
Net cash provided by (used in) financing activities	<u>1,479</u>	<u>(172)</u>
Effect of exchange rate changes on cash and cash equivalents	(2,750)	2,053
Net increase (decrease) in cash and cash equivalents	1,852	19,974
Cash, cash equivalents and restricted cash, beginning of period	173,759	122,683
Cash, cash equivalents and restricted cash, end of period	<u>\$ 175,611</u>	<u>\$ 142,657</u>
Supplemental disclosure of non-cash activities:		
Income taxes paid	\$ 1,458	\$ 2,150
Non-cash effect of adoption of ASU 2016-16	\$ 5,609	\$ —
Payment of contingent consideration in common stock	<u>\$ —</u>	<u>\$ 1,062</u>

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

REPLIGEN CORPORATION
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

1. Basis of Presentation

The condensed consolidated financial statements included herein have been prepared by Repligen Corporation (the “Company”, “Repligen” or “we”) in accordance with generally accepted accounting principles in the United States (“U.S. GAAP”) and pursuant to the rules and regulations of the Securities and Exchange Commission (“SEC”), for Quarterly Reports on Form 10-Q and Article 10 of Regulation S-X and do not include all of the information and footnote disclosures required by U.S. GAAP. These condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and accompanying notes thereto included in the Company’s Annual Report on Form 10-K for the fiscal year ended December 31, 2017.

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

The condensed consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries, Repligen Sweden AB (“Repligen Sweden”), Repligen GmbH, Repligen Singapore Pte. Ltd., our former subsidiary, TangenX Technology Corporation (“TangenX,” acquired on December 14, 2016 and merged into the Company as of June 30, 2017) and Spectrum LifeSciences, LLC (“Spectrum,” acquired on August 1, 2017). All significant intercompany accounts and transactions have been eliminated in consolidation.

In the opinion of management, the accompanying unaudited condensed consolidated financial statements include all adjustments, consisting of only normal, recurring adjustments necessary for a fair presentation of the financial position, results of operations and cash flows. The results of operations for the interim periods presented are not necessarily indicative of results to be expected for the entire year.

Recently Issued Accounting Pronouncements

In May 2014, the FASB issued ASU No. 2014-09, “Revenue from Contracts with Customers (Topic 606),” (“ASC 606”) which supersedes the revenue recognition requirements in Accounting Standards Codification Topic 605, *Revenue Recognition*, and creates a new Topic 606, *Revenue from Contracts with Customers*. Two adoption methods are permitted: retrospectively to all prior reporting periods presented, with certain practical expedients permitted; or retrospectively with the cumulative effect of initially adopting the ASU recognized at the date of initial application. The adoption of this ASU included updates as provided under ASU 2015-14, “Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date”; ASU 2016-08, “Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net)”; ASU 2016-10, “Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing”; and ASU 2016-12, “Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Practical Expedients.” The Company adopted the provisions of ASC 606 using the modified retrospective method effective January 1, 2018. See Note 3 for further discussion of the effects of this standard on the Company’s consolidated financial statements.

In January 2016, the FASB issued ASU No. 2016-01, “Financial Instruments—Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities.” This guidance changes how entities measure equity investments that do not result in consolidation and are not accounted for under the equity method. Entities will be required to measure these investments at fair value at the end of each reporting period and recognize changes in fair value in net income. A practicability exception will be available for equity investments that do not have readily determinable fair values; however, the exception requires the Company to consider relevant transactions that can be reasonably known to identify any observable price changes that would impact the fair value. This guidance also changes certain disclosure requirements and other aspects of current U.S. GAAP. The Company adopted this guidance in the first quarter of 2018. Because the Company does not hold any equity securities as of December 31, 2017 and June 30, 2018, adoption of this standard did not have any impact on its consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, “Leases (Topic 842)” (“ASU 2016-02”). ASU 2016-02 requires lessees to recognize a right-of-use asset and a lease liability for most leases. Extensive quantitative and qualitative disclosures, including significant judgments made by management, will be required to provide greater insight into the extent of revenue and expense recognized and expected to be recognized from existing contracts. The accounting applied by a lessor is largely unchanged from that applied under the current standard. The standard provides for certain practical expedients and must be adopted using either a modified retrospective transition approach or retrospectively with the cumulative effect of initially adopting the ASU recognized at the date of initial application. This ASU is effective for public entities for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company has commenced its review of leases as part of this standard, but has not finalized its assessment of the impact of the new standard on its consolidated financial statements. The Company expects this new standard to have a material impact on the Company’s consolidated balance sheet.

In August 2016, the FASB issued ASU No. 2016-15, “Statement of Cash Flows (Topic 203): Classification of Certain Cash Receipts and Cash Payments”. ASU No. 2016-15 addresses eight specific cash flow issues and clarifies their presentation and classification in the Statement of Cash Flows. This ASU is effective for fiscal years beginning after December 15, 2017 and is to be applied retrospectively with early adoption permitted. The Company has historically classified payments up to the amount of its contingent consideration liability recognized at the date of its acquisition as financing activities, with additional payments classified as operating activities. Because the Company has classified its contingent consideration payments as required by this standard, the adoption of this standard did not have any impact on its consolidated financial statements when applied on a retrospective basis.

In October 2016, the FASB issued ASU 2016-16, “Intra-Entity Transfers of Assets Other Than Inventory.” ASU 2016-16 requires that the income tax consequences of an intra-entity asset transfer other than inventory are recognized at the time of the transfer. An entity will continue to recognize the income tax consequences of an intercompany transfer of inventory when the inventory is sold to a third party. The Company adopted this standard on a modified-retrospective basis on January 1, 2018. See Note 12 for a discussion of the impact of this ASU on the Company’s financial statements.

In November 2016, the FASB issued ASU No. 2016-18, “Statement of Cash Flows (Topic 230): Restricted Cash,” which requires that the statement of cash flows explain the change during the period in the total cash, which is inclusive of cash and cash equivalents and amounts generally described as restricted cash or restricted cash equivalents. Restricted cash and restricted cash equivalents will be included with cash and cash equivalents when reconciling the beginning of period and end of period balances on the statement of cash flows upon adoption of this standard. The Company adopted this standard on a retrospective basis on January 1, 2018. The adoption resulted in an increase to cash, cash equivalents and restricted cash of \$450,000 in the statement of cash flows at December 31, 2016 and June 30, 2017. The Company did not hold any restricted cash at December 31, 2017 or June 30, 2018.

In January 2017, the FASB issued ASU No. 2017-01, “Business Combinations (Topic 805): Clarifying the Definition of a Business”, which clarifies the definition of a business to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The Company adopted this standard as of January 1, 2018, and the adoption of ASU 2017-01 did not have a material impact on the Company’s consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-04, “Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment,” eliminating the requirement to calculate the implied fair value, essentially eliminating step two from the goodwill impairment test. ASU No. 2017-04 requires goodwill impairment to be based upon the results of step one of the impairment test, which is defined as the excess of the carrying value of a reporting unit over its fair value. The impairment charge will be limited to the amount of goodwill allocated to that reporting unit. The standard is effective for the Company on a prospective basis beginning on January 1, 2020, with early adoption permitted. The Company adopted this standard as of January 1, 2018, and the adoption of this standard did not have a material impact on the Company’s consolidated financial statements.

In February 2018, the FASB issued ASU 2018-02, “Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income,” which gives entities the option to reclassify to retained earnings tax effects related to items that have been stranded in accumulated other comprehensive income as a result of the Tax Cuts and Jobs Act (the “Act”). For all entities, the guidance is effective for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. Entities can choose whether to apply the amendments retrospectively to each period in which the effect of the Act is recognized or to apply the amendments in the period of adoption. The Company has not assessed the impact of the new standard on its consolidated financial statements, but does not expect this new standard to have a material impact on the Company’s consolidated financial statements.

2. Acquisition of Spectrum LifeSciences, LLC

On August 1, 2017, the Company completed the acquisition of Spectrum pursuant to the terms of an Agreement and Plan of Merger and Reorganization, dated as of June 22, 2017 (such acquisition, the “Spectrum Acquisition”).

Spectrum is a diversified filtration company with a differentiated portfolio of hollow fiber cartridges, benchtop to commercial scale filtration and perfusion systems and a broad portfolio of disposable and single-use solutions. Spectrum’s products are primarily used for the filtration, isolation, purification and concentration of monoclonal antibodies, vaccines, recombinant proteins, diagnostic products and cell therapies where the company offers both standard and customized solutions to its bioprocessing customers.

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Spectrum's filtration products include its KrosFlo® line of hollow fiber cartridges, tangential flow filtration ("TFF") systems and single-use flow path consumables, as well as its Spectra/Por® portfolio of laboratory dialysis products and its Pro-Connex® single-use hollow fiber Module-Bag-Tubing sets. Outside of filtration, Spectrum products include Spectra/Chrom® liquid chromatography products for research applications. These bioprocessing products account for the majority of Spectrum revenues. Spectrum also offers a line of operating room products.

Consideration Transferred

The Company accounted for the Spectrum Acquisition as a purchase of a business under ASC 805, "Business Combinations." The Spectrum Acquisition was funded through payment of approximately \$122.9 million in cash, issuance of 6,153,995 unregistered shares of the Company's common stock totaling \$247.6 million and a working capital adjustment of \$425,000 for a total purchase price of \$370.9 million. Under the acquisition method of accounting, the assets of Spectrum were recorded as of the acquisition date, at their respective fair values, and consolidated with those of the Company. The fair value of the net assets acquired was approximately \$370.9 million.

The consideration and purchase price information has been prepared using a valuation that required the use of significant assumptions and estimates in its preparation. Critical estimates included, but were not limited to, future expected cash flows, including projected revenues and expenses, and the applicable discount rates. These estimates were based on assumptions that the Company believes to be reasonable; however, actual results may differ from these estimates.

The total consideration transferred follows (in thousands):

Cash consideration	\$ 122,932
Equity consideration	247,575
Working capital adjustment	425
Net assets acquired	<u>\$ 370,932</u>

Acquisition and integration-related costs are not included as a component of consideration transferred, but are expensed in the periods in which the costs are incurred. The Company has incurred \$1,508,000 in integration costs related to the Spectrum Acquisition for the six-month period ended June 30, 2018 and \$7,060,000 in acquisition and integration costs for the year ended December 31, 2017. These costs are primarily included in selling, general and administrative expenses in the consolidated statements of operations.

Fair Value of Net Assets Acquired

The allocation of purchase price was based on the fair value of assets acquired and liabilities assumed as of August 1, 2017, based on the preliminary valuation. The components and allocation of the purchase price consists of the following amounts (in thousands):

Cash and cash equivalents	\$ 10,137
Accounts receivable	5,075
Inventory	13,502
Prepaid expenses and other assets	616
Fixed assets	6,004
Deferred tax assets	1,102
Customer relationships	78,400
Developed technology	38,560
Trademark and tradename	2,160
Non-competition agreements	960
Goodwill	265,722
Accounts payable	(1,335)
Unrecognized tax benefit	(576)
Accrued liabilities	(5,787)
Deferred tax liabilities	(43,608)
Fair value of net assets acquired	<u>\$ 370,932</u>

Of the consideration paid, \$78.4 million represents the fair value of customer relationships that is amortized over the weighted average determined useful life of 15 years, and \$38.6 million represents the fair value of developed technology that is amortized over a weighted average determined useful life of 20 years. \$960,000 represents the fair value of non-competition agreements that are amortized over a determined life of 3 years. \$2.2 million represents the fair value of trademarks and trade names that are determined to have an indefinite useful life. The aforementioned intangible assets are amortized on a straight-line basis.

The goodwill of \$265.7 million represents future economic benefits expected to arise from synergies from combining operations and commercial organizations to increase market presence and the extension of existing customer relationships. None of the goodwill recorded is expected to be deductible for income tax purposes.

The purchase price allocation may be subject to adjustment as purchase accounting is preliminary as of June 30, 2018 related to inventory valuation. The final allocation may include, but not be limited to, changes in allocations to inventory and goodwill.

Revenue, Net Income and Pro Forma Presentation

The Company recorded revenue from Spectrum of \$12,313,000 and \$24,031,000 for the three- and six-month periods ended June 30, 2018, respectively, and \$19,394,000 from August 1, 2017, the date of acquisition, through December 31, 2017. The Company has included the operating results of Spectrum in its consolidated statements of operations since the August 1, 2017 acquisition date. The following table presents unaudited supplemental pro forma information as if the Spectrum Acquisition had occurred as of January 1, 2016 (in thousands, except per share data):

	Pro-forma Six months ended June 30, 2017
Total revenue	81,774
Net income	12,057
Earnings per share:	
Basic	\$ 0.28
Diluted	\$ 0.28

The unaudited pro forma information for the six-month period ended June 30, 2018 was calculated after applying the Company's accounting policies and the impact of acquisition date fair value adjustments. The unaudited pro forma net income for the six-month period ended June 30, 2018 was adjusted to exclude acquisition-related transaction costs, as these expenses would have been incurred in the prior year assuming the Spectrum Acquisition closed on January 1, 2016.

These pro forma condensed consolidated financial results include certain adjustments to reflect the pro forma results of operations as if the acquisition had occurred as of January 1, 2016. The pro forma information does not reflect the effect of costs or synergies that would have been expected to result from the integration of the acquisition. The pro forma information does not purport to be indicative of the results of operations that actually would have resulted had the combinations occurred at the beginning of the period presented, or of future results of the consolidated entities.

3. Revenue Recognition

Adoption of ASC Topic 606, Revenue from Contracts with Customers

The Company adopted ASC 606 on January 1, 2018, using the modified retrospective method for all contracts not completed as of the date of adoption. For contracts that were modified before the effective date, the Company reflected the aggregate effect of all modifications when identifying performance obligations and allocating transaction price in accordance with the practical expedient in paragraph ASC 606-10-65-1-(f)-4, which did not have a material effect on the cumulative impact of adopting ASC 606. Results for reporting periods beginning January 1, 2018 are presented under ASC 606, while prior period amounts are not adjusted and continue to be reported under the accounting standards in effect for the prior period. The impact to the Company's consolidated financial statements as a result of applying ASC 606 was immaterial. Deferred revenue resulting from contracts with customers is included in accrued expenses on the Company's consolidated balance sheet.

Revenue Recognition

Revenue is recognized when, or as, obligations under the terms of a contract are satisfied, which occurs when control of the promised products or services is transferred to customers. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring products or services to a customer ("transaction price"). To the extent the transaction price includes variable consideration, the Company estimates the amount of variable consideration that should be included in the transaction price utilizing the expected value method or the most likely amount method, depending on the facts and circumstances relative to the contract. Variable consideration is included in the transaction price if, in the Company's judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. Estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of the Company's anticipated performance and all information (historical, current and forecasted) that is reasonably available. Sales, value add, and other taxes collected on behalf of third parties are excluded from revenue.

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When determining the transaction price of a contract, an adjustment is made if payment from a customer occurs either significantly before or significantly after performance, resulting in a significant financing component. Applying the practical expedient in paragraph 606-10-32-18, the Company does not assess whether a significant financing component exists if the period between when the Company performs its obligations under the contract and when the customer pays is one year or less. None of the Company's contracts contained a significant financing component as of June 30, 2018.

Contracts with customers may contain multiple performance obligations. For such arrangements, the transaction price is allocated to each performance obligation based on the estimated relative standalone selling prices of the promised products or services underlying each performance obligation. The Company determines standalone selling prices based on the price at which the performance obligation is sold separately. If the standalone selling price is not observable through past transactions, the Company estimates the standalone selling price taking into account available information such as market conditions and internally approved pricing guidelines related to the performance obligations.

The Company recognizes product revenue under the terms of each customer agreement upon transfer of control to the customer, which occurs at a point in time.

Disaggregation of Revenue

Revenues for the three- and six-month periods ended June 30, 2018 and 2017 were as follows:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Product revenue	\$47,743	\$32,434	\$15,309	47.2%	\$92,542	\$63,003	\$29,539	46.9%
Royalty and other revenue	(12)	21	(33)	(157.1%)	19	42	(23)	(54.8%)
Total revenues	<u>\$47,731</u>	<u>\$32,455</u>	<u>\$15,276</u>	47.1%	<u>\$92,561</u>	<u>\$63,045</u>	<u>\$29,516</u>	46.8%

When disaggregating revenue, the Company considered all of the economic factors that may affect its revenues. Because all of its revenues are from bioprocessing customers, there are no differences in the nature, timing and uncertainty of the Company's revenues and cash flows from any of its product lines. However, given that the Company's revenues are generated in different geographic regions, factors such as regulatory and geopolitical factors within those regions could impact the nature, timing and uncertainty of the Company's revenues and cash flows. In addition, a significant portion of the Company's revenues are generated from two customers; therefore, economic factors specific to these two customers could impact the nature, timing and uncertainty of the Company's revenues and cash flows.

The following tables disaggregate the Company's revenue from contracts with customers by geographic region (in thousands).

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
North America	\$22,481	\$12,437	\$42,491	\$24,089
Europe	19,578	16,155	39,148	32,562
Asia and Australia	5,617	3,604	10,692	5,926
Other	55	259	230	468
Total	<u>\$47,731</u>	<u>\$32,455</u>	<u>\$92,561</u>	<u>\$63,045</u>

Revenue from significant customers is as follows (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
MilliporeSigma	\$ 8,679	\$ 6,049	\$15,390	\$12,504
GE Healthcare	6,777	9,130	14,510	17,390

Protein Products

The Company's protein product line generates revenue through the sale of Protein A ligands and growth factors. Protein A ligands are an essential component of Protein A chromatography resins (media) used in the purification of virtually all mAb-based drugs on the market or in development. The Company manufactures multiple forms of Protein A ligands under long-term supply agreements with major life sciences companies, who in turn sell their Protein A chromatography media to end users (biopharmaceutical manufacturers). The Company also manufactures growth factors for sale under long-term supply agreements with certain life sciences companies as well as direct sales to its customers. Each protein product is considered distinct and therefore represents a separate performance obligation. Protein product revenue is generally recognized at a point in time upon transfer of control to the customer.

Filtration Products

The Company's filtration product line generates revenue through the sale of KrosFlo[®] hollow fiber ("HF") TFF membranes and modules, ProConnex[®] single-use flow path connectors, flat sheet TFF cassettes and hardware, and XCell[™] alternating tangential flow ("ATF") devices and related consumables.

The Company markets the KrosFlo line of HF cartridges and TFF systems and the ProConnex line of single-use flow path connectors which were acquired as part of the acquisition of Spectrum in August 2017. These products are used in the filtration, isolation, purification and concentration of biologics and diagnostic products. Sales of large-scale systems generally include components and consumables as well as training and installation services at the request of the customer. Because the initial sale of components and consumables are necessary for the operation of the system, such items are combined with the systems as a single performance obligation. Training and installation services do not significantly modify or customize these systems and therefore represent a distinct performance obligation.

The Company's other filtration product offerings are not highly interdependent of one another and are therefore considered distinct products that represent separate performance obligations. Revenue on these products is generally recognized at a point in time upon transfer of control to the customer. The Company invoices the customer for the installation and training services in an amount that directly corresponds with the value to the customer of the Company's performance to date; therefore, revenue recognized is based on the amount billable to the customer in accordance with the practical expedient under ASC 606-10-55-18.

The Company also markets flat sheet TFF cassettes and hardware. TFF is a rapid and efficient method for separation and purification of biomolecules that is widely used in laboratory, process development and process scale applications in biopharmaceutical manufacturing. The Company's single-use Sius[™] TFF cassettes and hardware are not highly interdependent of one another and are therefore considered distinct products that represent separate performance obligations. Sius TFF product revenue is generally recognized at a point in time upon transfer of control to the customer.

The Company also markets the XCell[™] ATF System, a technologically advanced filtration device used in upstream processes to continuously remove cellular metabolic waste products during the course of a fermentation run, freeing healthy cells to continue producing the biologic drug of interest. ATF Systems typically include a filtration system and consumables (i.e., tube devices, metal stands) as well as training and installation services at the request of the customer. The filtration system and consumables are considered distinct products and therefore represent separate performance obligations. First time purchasers of the systems typically purchase a controller that is shipped with the tube device(s) and metal stand(s). The controller is not considered distinct as it is a proprietary product that is highly interdependent with the filtration system; therefore, the controller is combined with the filtration system and accounted for as a single performance obligation. The training and installation services do not significantly modify or customize the ATF system and therefore represent a distinct performance obligation. ATF system product revenue related to the filtration system (including the controller if applicable) and consumables is generally recognized at a point in time upon transfer of control to the customer. ATF system service revenue related to training and installation services is generally recognized over time, as the customer simultaneously receives and consumes the benefits as the Company performs. The Company invoices the customer for the installation and training services in an amount that directly corresponds with the value to the customer of the Company's performance to date; therefore, revenue recognized is based on the amount billable to the customer in accordance with the practical expedient under ASC 606-10-55-18.

Chromatography Products

The Company's chromatography product line includes a number of products used in the downstream purification and quality control of biological drugs. The majority of chromatography revenue relates to the OPUS pre-packed chromatography column line and Protein A chromatography resins. OPUS columns typically consist of the outer hardware of the column with a resin as ordered by the customer packed inside of the column. OPUS columns may also be ordered without the packed resin. In either scenario, the OPUS column and resin are not interdependent of one another and are therefore considered distinct products that represent separate performance obligations. Chromatography product revenue is generally recognized at a point in time upon transfer of control to the customer.

Other Products

The Company's other products include ELISA test kits used by quality control departments to detect and measure the presence of leached Protein A and/or growth factor in the final product. Each ELISA kit is considered distinct and therefore represents a separate performance obligation. Other product revenue is generally recognized at a point in time upon transfer of control to the customer.

Transaction Price Allocated to Future Performance Obligations

Remaining performance obligations represents the transaction price of contracts for which work has not been performed or has been partially performed. The Company's future performance obligations relate primarily to the installation and training of certain of its systems sold to customers. These performance obligations are completed within one year of receipt of a purchase order from its customers. Accordingly, the Company has elected to not disclose the value of these unsatisfied performance obligations as provided under ASC 606-10-50-14.

Contract Balances from Contracts with Customers

The following table provides information about receivables and deferred revenue from contracts with customers as of June 30, 2018 (in thousands):

	2018
Balances from contracts with customers only:	
Accounts receivable	\$31,713
Deferred revenue	1,175
Revenue recognized in the period relating to:	
The beginning deferred revenue balance	\$ 751
Changes in pricing related to products or services satisfied in previous periods	—
Impairment losses on receivables	—

The timing of revenue recognition, billings and cash collections results in accounts receivables and deferred revenue on the Company's consolidated balance sheets.

A contract asset is created when the Company satisfies a performance obligation by transferring a promised good to the customer. Contract assets may represent conditional or unconditional rights to consideration. The right is conditional, and recorded as a contract asset, if the Company must first satisfy another performance obligation in the contract before it is entitled to payment from the customer. Contract assets are transferred to billed receivables once the right becomes unconditional. If the Company has the unconditional right to receive consideration from the customer, the contract asset is accounted for as a billed receivable and presented separately from other contract assets. A right is unconditional if nothing other than the passage of time is required before payment of that consideration is due.

When consideration is received, or such consideration is unconditionally due, from a customer prior to transferring goods or services to the customer under the terms of a contract, a contract liability is recorded. Contract liabilities are recognized as revenue after control of the products or services is transferred to the customer and all revenue recognition criteria have been met.

Costs to Obtain or Fulfill a Customer Contract

The Company's sales commission structure is based on achieving revenue targets. The commissions are driven by revenue derived from customer purchase orders which are short term in nature.

Applying the practical expedient in paragraph 340-40-25-4, the Company recognizes the incremental costs of obtaining contracts as an expense when incurred if the amortization period of the assets that the Company otherwise would have recognized is one year or less. These costs are included in selling, general, and administrative expenses. When shipping and handling costs are incurred after a customer obtains control of the products, the Company accounts for these as costs to fulfill the promise and not as a separate performance obligation.

4. Accumulated Other Comprehensive Income

The following table summarizes the changes in accumulated other comprehensive income by component (in thousands):

(In thousands)	Foreign currency translation gain (loss)
Balance at December 31, 2017	\$ (6,363)
Foreign currency translation loss	\$ (4,780)
Balance at June 30, 2018	<u>\$ (11,143)</u>

5. Earnings Per Share

The Company reports earnings per share in accordance with ASC Topic 260, “Earnings Per Share,” which establishes standards for computing and presenting earnings per share. Basic earnings per share is computed by dividing net income available to common shareholders by the weighted-average number of common shares outstanding during the period. Diluted earnings per share is computed by dividing net income available to common shareholders by the weighted-average number of common shares and dilutive common share equivalents then outstanding. Potential common share equivalents consist of restricted stock awards and the incremental common shares issuable upon the exercise of stock options. Under the treasury stock method, unexercised “in-the-money” stock options and warrants are assumed to be exercised at the beginning of the period or at issuance, if later. The assumed proceeds are then used to purchase common shares at the average market price during the period. Share-based payment awards that entitle their holders to receive non-forfeitable dividends before vesting are considered participating securities and are considered in the calculation of basic and diluted earnings per share. There were no such participating securities outstanding during the three- and six-month periods ended June 30, 2018 and 2017.

Basic and diluted weighted average shares outstanding were as follows:

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Weighted average common shares	43,743,356	34,097,805	43,682,650	33,995,323
Dilutive common stock options and restricted stock units	480,561	437,427	433,961	433,483
Dilutive effect of convertible senior notes	791,802	559,582	578,134	286,991
Weighted average common shares, assuming dilution	<u>45,015,720</u>	<u>35,094,814</u>	<u>44,694,745</u>	<u>34,715,797</u>

At June 30, 2018, there were outstanding options to purchase 1,058,834 shares of the Company’s common stock at a weighted average exercise price of \$26.72 per share and 716,996 restricted stock units. For the three- and six-month periods ended June 30, 2018, 551,012 and 615,930 options to purchase shares of the Company’s common stock, respectively, were excluded from the calculation of diluted earnings per share because the exercise prices of the stock options were greater than or equal to the average price of the common shares, and were therefore anti-dilutive.

At June 30, 2017, there were outstanding options to purchase 803,532 shares of the Company’s common stock at a weighted average exercise price of \$20.16 per share and 393,338 restricted stock units. For the three- and six-month periods ended June 30, 2017, 187,072 and 222,001 options to purchase shares of the Company’s common stock, respectively, were excluded from the calculation of diluted earnings per share because the exercise prices of the stock options were greater than or equal to the average price of the common shares, and were therefore anti-dilutive.

As provided by the terms of the indenture underlying the Company’s 2.125% Convertible Senior Notes due 2021 (the “Notes”), the Company has a choice to settle the conversion obligation for the Notes in cash, shares or any combination of the two. The Company currently intends to settle the par value of the Notes in cash and any excess conversion premium in shares. The Company applies the provisions of ASC 260, *Earnings Per Share*, Subsection 10-45-44, to determine the diluted weighted average shares outstanding as it relates to the conversion spread on its convertible notes. Accordingly, the par value of the Notes will not be included in the calculation of diluted income per share, but the dilutive effect of the conversion premium will be considered in the calculation of diluted net income per share using the treasury stock method. The dilutive impact of the Company’s convertible notes is based on the difference between the Company’s current period average stock price and the conversion price of the convertible notes, provided there is a premium. Pursuant to this accounting standard, there is no dilution from the accreted principal of the Notes as of June 30, 2018 and June 30, 2017.

6. Inventories

Inventories relate to the Company's bioprocessing business. The Company values inventory at cost or, if lower, market value, using the first-in, first-out method. The Company reviews its inventories at least quarterly and records a provision for excess and obsolete inventory based on its estimates of expected sales volume, production capacity and expiration dates of raw materials, work-in-process and finished products. Expected sales volumes are determined based on supply forecasts provided by key customers for the next 3 to 12 months. The Company writes down inventory that has become obsolete, inventory that has a cost basis in excess of its expected net realizable value, and inventory in excess of expected requirements to cost of product revenue. Manufacturing of bioprocessing finished goods is done to order and tested for quality specifications prior to shipment.

A change in the estimated timing or amount of demand for the Company's products could result in additional provisions for excess inventory quantities on hand. Any significant unanticipated changes in demand or unexpected quality failures could have a significant impact on the value of inventory and reported operating results. During all periods presented in the accompanying financial statements, there have been no material adjustments related to a revised estimate of inventory valuations.

Work-in-process and finished products inventories consist of material, labor, outside processing costs and manufacturing overhead. Inventories consist of the following (in thousands):

	June 30, 2018	December 31, 2017
Raw Materials	\$ 23,946	\$ 22,351
Work-in-process	4,389	4,083
Finished products	12,613	12,570
Total	<u>\$ 40,948</u>	<u>\$ 39,004</u>

7. Property, Plant and Equipment

Property, plant and equipment consist of the following (in thousands):

	June 30, 2018	December 31, 2017
Land	\$ 1,023	\$ 1,023
Buildings	764	764
Leasehold improvements	15,770	15,673
Equipment	23,199	21,904
Furniture and fixtures	4,429	4,272
Construction in progress	4,532	2,581
Total property, plant and equipment	49,717	46,217
Less: accumulated depreciation	(25,724)	(23,800)
Property, plant and equipment, net	<u>\$ 23,993</u>	<u>\$ 22,417</u>

Depreciation expense totaled approximately \$2,598,000 and \$1,858,000 for the six-month periods ended June 30, 2018 and 2017, respectively.

8. Intangible Assets

Intangible assets are amortized over their useful lives using the straight-line method, as applicable, and the amortization expense is recorded within selling, general and administrative expense in the Company's statements of comprehensive income.

The Company reviews its indefinite-lived intangible assets not subject to amortization to determine if adverse conditions exist or a change in circumstances exists that would indicate an impairment. Intangible assets and their related useful lives are reviewed at least annually to determine if any adverse conditions exist that would indicate the carrying value of these assets may not be recoverable. More frequent impairment assessments are conducted if certain conditions exist, including a change in the competitive landscape, any internal decisions to pursue new or different technology strategies, a loss of a significant customer, or a significant change in the marketplace, including changes in the prices paid for our products or changes in the size of the market for our products. An impairment results if the carrying value of the asset exceeds the estimated fair value of the asset. If the estimate of an intangible asset's remaining useful life is changed, the remaining carrying amount of the intangible asset is amortized prospectively over the revised remaining useful life. The Company continues to believe that its intangible assets are recoverable at June 30, 2018.

Intangible assets consisted of the following at June 30, 2018 (in thousands):

	Gross Carrying Amount	Accumulated Amortization	Weighted Average Useful Life (in years)
Technology – developed	\$ 51,701	\$ (4,537)	19
Patents	240	(240)	8
Customer relationships	101,577	(12,986)	14
Trademark – definite lived	2,160	(103)	20
Trademark – indefinite lived	700	—	—
Other intangibles	1,062	(392)	3
Total intangible assets	<u>\$ 157,440</u>	<u>\$ (18,258)</u>	16

Intangible assets consisted of the following at December 31, 2017 (in thousands):

	Gross Carrying Amount	Accumulated Amortization	Weighted Average Useful Life (in years)
Technology – developed	\$ 51,801	\$ (3,201)	19
Patents	240	(238)	8
Customer relationships	102,120	(9,636)	14
Trademarks – definite lived	2,160	(47)	20
Trademarks – indefinite lived	700	—	—
Other intangibles	1,063	(209)	3
Total intangible assets	<u>\$ 158,084</u>	<u>\$ (13,331)</u>	16

Amortization expense for amortized intangible assets was approximately \$5,298,000 and \$1,484,000 for the six-month periods ended June 30, 2018 and 2017, respectively. As of June 30, 2018, the Company expects to record amortization expense as follows (in thousands):

Years Ending	Amortization Expense
December 31, 2018 (six months remaining)	\$ 5,284
December 31, 2019	10,456
December 31, 2020	9,866
December 31, 2021	9,365
December 31, 2022	9,363

9. Accrued Liabilities

Accrued liabilities consist of the following (in thousands):

	June 30, 2018	December 31, 2017
Employee compensation	\$ 7,703	\$ 9,560
Taxes	937	1,668
Royalty and license fees	372	1,383
Accrued purchases	674	1,191
Professional fees	403	947
Deferred revenue	1,175	960
Other accrued expenses	1,838	2,220
Total	<u>\$ 13,102</u>	<u>\$ 17,929</u>

10. Convertible Senior Notes

The carrying value of the Company's convertible senior notes is as follows (in thousands):

	<u>June 30, 2018</u>	<u>December 31, 2017</u>
2.125% Convertible Senior Notes due 2021:		
Principal amount	\$ 114,989	\$ 115,000
Unamortized debt discount	(11,617)	(13,395)
Unamortized debt issuance costs	(2,043)	(2,355)
Total convertible senior notes	\$ 101,329	\$ 99,250
Less: Current portion	(101,329)	—
Total convertible senior notes, long term	<u>\$ —</u>	<u>\$ 99,250</u>

On May 24, 2016, the Company issued \$115 million aggregate principal amount of its Notes. The net proceeds from the sale of the Notes, after deducting the underwriting discounts and commissions and other related offering expenses, were approximately \$111.1 million. The Notes bear interest at the rate of 2.125% per annum, payable semiannually in arrears on June 1 and December 1 of each year, beginning December 1, 2016.

The Notes will mature on June 1, 2021, unless earlier repurchased, redeemed or converted in accordance with their terms. Prior to March 1, 2021, the Notes will be convertible at the option of holders of the Notes only upon satisfaction of certain conditions and during certain periods, and thereafter, the notes will be convertible at any time until the close of business on the second scheduled trading day immediately preceding the maturity date. Upon conversion, holders of the Notes will receive shares of the Company's common stock, cash or a combination thereof, at the Company's election. It is the Company's current intent and policy to settle all conversions through combination settlement, which involves satisfying the principal amount outstanding with cash and any note conversion value over the principal amount in shares of the Company's common stock.

Notes with a par value of \$11,000 were submitted for conversion in the fourth quarter of 2017, and this conversion was settled in the first quarter of 2018. The conversion resulted in the issuance of a nominal amount of shares of the Company's common stock, and the Company recorded a loss of \$1,000 on the conversion of these Notes.

During the second quarter of 2018, the closing price of the Company's common stock exceeded 130% of the conversion price of the Notes for more than 20 trading days of the last 30 consecutive trading days of the quarter. As a result, the Notes are convertible at the option of the holders of the Notes during the third quarter of 2018. The Company reclassified the carrying value of the Notes from long term liabilities to current liabilities on the Company's consolidated balance sheet as of June 30, 2018. As of June 30, 2018, the if-converted value of the Notes exceeded the aggregate principal amount by approximately \$63.8 million. As of the date of this filing, no Notes have been converted by the holders of such Notes in the third quarter of 2018. In the event the closing price conditions are met in the third quarter of 2018 or a future fiscal quarter, the Notes will be convertible at a holder's option during the immediately following fiscal quarter.

The conversion rate for the Notes will initially be 31.1813 shares of the Company's common stock per \$1,000 principal amount of Notes, which is equivalent to an initial conversion price of approximately \$32.07 per common share, and is subject to adjustment under the terms of the Notes. Holders of the Notes may require the Company to repurchase their Notes upon the occurrence of a fundamental change prior to maturity for cash at a repurchase price equal to 100% of the principal amount of the Notes to be repurchased plus accrued and unpaid interest, if any, to, but excluding, the repurchase date.

The Company will not have the right to redeem the Notes prior to June 5, 2019, but may redeem the Notes, at its option, in whole or in part, on any business day on or after June 5, 2019 and prior to the maturity date if the last reported sale price of the Company's common stock has been at least 130% of the conversion price then in effect for at least 20 trading days (whether or not consecutive) during any 30 consecutive trading day period ending on, and including, the trading day immediately preceding the date on which the Company provides written notice of redemption. The redemption price will be equal to 100% of the principal amount of the principal amount of Notes to be redeemed plus accrued and unpaid interest to, but excluding, the redemption date.

The Notes contain customary terms and events of default. If an event of default (other than certain events of bankruptcy, insolvency or reorganization involving the Company) occurs and is continuing, the holders of at least 25% in aggregate principal amount of the outstanding Notes may declare 100% of the principal of, and any accrued and unpaid interest on, all of the Notes to be due and payable. Upon the occurrence of certain events of bankruptcy, insolvency or reorganization involving the Company, 100% of the principal of and accrued and unpaid interest, if any, on all of the Notes will become due and payable automatically. Notwithstanding the foregoing, the Notes provide that, to the extent the Company elects and for up to 270 days, the sole remedy for an event of default relating to certain failures by the Company to comply with certain reporting covenants consist exclusively of the right to receive additional interest on the Notes. The Company is not aware of any events of default, current events or market conditions that would allow holders to call or convert the Notes as of June 30, 2018.

The cash conversion feature of the Notes required bifurcation from the Notes and was initially accounted for as an equity instrument classified to stockholders' equity, as the conversion feature was determined to be clearly and closely related to the Company's stock. Based on market data available for publicly traded, senior, unsecured corporate bonds issued by companies in the same industry and asset base and with similar maturity, the Company estimated the implied interest rate, assuming no conversion option. Assumptions used in the estimate represent what market participants would use in pricing the liability component, including market interest rates, credit standing, and yield curves, all of which are defined as Level 2 observable inputs. The estimated implied interest rate was applied to the Notes, which resulted in a fair value of the liability component of \$96,289,000 upon issuance, calculated as the present value of implied future payments based on the \$115 million aggregate principal amount. The equity component of the Notes was recognized as a debt discount, recorded in additional paid-in capital, and represents the difference between the aggregate principal of the Notes and the fair value of the Notes without conversion option on their issuance date. The debt discount is amortized to interest expense using the effective interest method over five years, or the life of the Notes. The Company assesses the equity classification of the cash conversion feature quarterly, and it is not re-measured as long as it continues to meet the conditions for equity classification.

Interest expense recognized on the Notes during the three-month period ended June 30, 2018 includes \$611,000, \$896,000 and \$157,000 for the contractual coupon interest, the accretion of the debt discount and the amortization of the debt issuance costs, respectively. Interest expense recognized on the Notes during the six-month period ended June 30, 2018 includes \$1,222,000, \$1,777,000 and \$312,000 for the contractual coupon interest, the accretion of the debt discount and the amortization of the debt issuance costs, respectively. The effective interest rate on the Notes is 6.6%, which includes the interest on the Notes, amortization of the debt discount and debt issuance costs. As of June 30, 2018, the carrying value of the Notes was approximately \$101.3 million and the fair value of the principal was approximately \$178.8 million. The fair value of the Notes was determined based on the most recent trade activity of the Notes as of June 30, 2018.

11. Stock-Based Compensation

For the three-month periods ended June 30, 2018 and 2017, the Company recorded stock-based compensation expense of approximately \$2,625,000 and \$1,496,000, respectively, for share-based awards granted under the Second Amended and Restated 2001 Repligen Corporation Stock Plan (the "2001 Plan"), the Repligen Corporation Amended and Restated 2012 Stock Option and Incentive Plan (the "2012 Plan,"), and the Repligen Corporation 2018 Stock Option and Incentive Plan (the "2018 Plan," and together with the 2001 Plan and the 2012 Plan, the "Plans"). The Company recorded stock-based compensation expense of approximately \$4,893,000 and \$3,027,000 for the six-month periods ended June 30, 2018 and 2017, respectively, for share-based awards granted under the Plans.

The following table presents stock-based compensation expense included in the Company's consolidated statements of comprehensive income (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Cost of product revenue	\$ 234	\$ 153	\$ 500	\$ 294
Research and development	227	79	397	211
Selling, general and administrative	2,164	1,264	3,996	2,522
Total	<u>\$ 2,625</u>	<u>\$ 1,496</u>	<u>\$ 4,893</u>	<u>\$ 3,027</u>

The 2018 Plan allows for the granting of incentive and nonqualified options to purchase shares of common stock, restricted stock units and other equity awards. Employee grants under the Plans generally vest over a three- to five-year period, with 20%-33% vesting on the first anniversary of the date of grant and the remainder vesting in equal yearly installments thereafter. Nonqualified options and restricted stock units issued to non-employee directors under the Plans generally vest over one year. In the first quarter of 2018, to create a longer term retention incentive, the Company's Compensation Committee granted long-term incentive compensation awards to its chief executive officer consisting of both stock options and restricted stock units that are subject to time-based vesting over nine years. Options granted under the Plans have a maximum term of ten years from the date of grant and generally, the exercise price of the stock options equals the fair market value of the Company's common stock on the date of grant. At June 30, 2018, options to purchase 1,058,834 shares and 716,996 restricted stock units were outstanding under the Plans. At June 30, 2018, 2,933,301 shares were available for future grant under the 2018 Plan.

The Company uses the Black-Scholes option pricing model to calculate the fair value of stock option awards on the grant date, and the Company uses the value of the common stock as of the grant date to value restricted stock units. The Company measures stock-based compensation cost at the grant date based on the estimated fair value of the award. The Company recognizes expense on awards with service based vesting over the employee's requisite service period on a straight-line basis. In the third quarter of 2017, the Company

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issued performance stock units to certain employees related to the Spectrum Acquisition which are tied to the achievement of certain revenue and gross margin metrics and the passage of time. Additionally, in the first quarter of 2018, the Company issued performance stock units to certain individuals which are tied to the achievement of certain 2018 revenue metrics and the passage of time. The Company recognizes expense on performance based awards over the vesting period based on the probability that the performance metrics will be achieved. The Company recognizes stock-based compensation expense for options that are ultimately expected to vest, and accordingly, such compensation expense has been adjusted for estimated forfeitures.

Information regarding option activity for the six-month period ended June 30, 2018 under the Plans is summarized below:

	Options Outstanding	Weighted- Average Exercise Price Per Share	Weighted- Average Remaining Contractual Term (in years)	(in thousands) Aggregate Intrinsic Value
Options outstanding at December 31, 2017	734,940	\$ 20.80		
Granted	429,678	34.48		
Exercised	(96,196)	15.49		
Forfeited/cancelled	(9,588)	29.71		
Options outstanding at June 30, 2018	<u>1,058,834</u>	\$ 26.72	7.57	\$ 21,518
Options exercisable at June 30, 2018	<u>448,068</u>	\$ 19.14	5.60	\$ 12,502
Vested and expected to vest at June 30, 2018 ⁽¹⁾	<u>1,008,777</u>	\$ 26.37	7.48	\$ 20,854

- (1) Represents the number of vested options as of June 30, 2018 plus the number of unvested options expected to vest as of June 30, 2018 based on the unvested outstanding options at June 30, 2018 adjusted for estimated forfeiture rates of 8% for awards granted to non-executive level employees and 3% for awards granted to executive level employees.

The aggregate intrinsic value in the table above represents the total pre-tax intrinsic value (the difference between the closing price of the common stock on June 30, 2018 of \$47.04 per share and the exercise price of each in-the-money option) that would have been received by the option holders had all option holders exercised their options on June 30, 2018.

The weighted average grant date fair value of options granted during the six-month periods ended June 30, 2018 and 2017 was \$18.41 and \$16.94, respectively. The total fair value of stock options that vested during the six-month periods ended June 30, 2018 and 2017 was approximately \$1,783,000 and \$1,734,000, respectively.

Information regarding restricted stock unit and performance stock unit activity for the six-month period ended June 30, 2018 under the Plans is summarized below:

	Units Outstanding	Weighted- Average Remaining Contractual Term (in years)	(in thousands) Aggregate Intrinsic Value
Restricted and performance stock units outstanding at December 31, 2017	505,235		
Granted	367,961		
Vested	(115,295)		
Forfeited/cancelled	(40,905)		
Restricted stock units outstanding at June 30, 2018	<u>716,996</u>	3.97	\$ 33,727
Vested and expected to vest at June 30, 2018 ⁽¹⁾	<u>654,423</u>	3.60	\$ 30,784

- (1) Represents the number of unvested restricted stock units expected to vest as of June 30, 2018 based on the unvested outstanding restricted stock units at June 30, 2018 adjusted for estimated forfeiture rates of 8% for awards granted to non-executive level employees and 3% for awards granted to executive level employees.

The aggregate intrinsic value in the table above represents the total pre-tax intrinsic value (equal to the closing price of the common stock on June 30, 2018 of \$47.04 per share) that would have been received by the restricted stock unit holders had all restricted stock units vested on June 30, 2018. The aggregate intrinsic value of restricted stock units vested during the six-month periods ended June 30, 2018 and 2017 was approximately \$4,239,000 and \$3,231,000, respectively.

The weighted average grant date fair value of restricted stock units granted during the three-month periods ended June 30, 2018 and 2017 was \$34.47 and \$33.06, respectively. The total grant date fair value of restricted stock units that vested during the three-month periods ended June 30, 2018 and 2017 was approximately \$3,340,000 and \$2,373,000, respectively.

As of June 30, 2018, there was \$30,256,000 of total unrecognized compensation cost related to unvested share-based awards. This cost is expected to be recognized over a weighted average remaining requisite service period of 4.60 years.

12. Income Taxes

The Company's effective tax rate for the three- and six-month periods ended June 30, 2018 was 18.7% and 22.1%, respectively, compared to (130.9%) and (49.0%), respectively, for the corresponding periods in the prior year. The effective tax rate for the three-month period ended June 30, 2018 was lower than the U.S. statutory rate of 21% due to R&D credit activity and windfall benefits on stock option exercises and restricted stock vestings, partially offset by state tax effects and the impact of the Global Intangible Low-Taxed Income ("GILTI") tax enacted as part of the Act enacted in December 2017. The effective tax rate for the six-month period ended June 30, 2018 was higher than the U.S. statutory tax rate of 21% due to state tax effects and the impact of the GILTI tax. For the three- and six-month periods ended June 30, 2017, the effective tax rate was lower than the U.S. statutory tax rate of 34% primarily due to the sale of intellectual property from Repligen Corporation to Repligen Sweden AB. The Company utilized certain of its U.S. deferred tax assets as a result of this sale and reduced its valuation allowance on these deferred tax assets by approximately \$9,200,000 in the second quarter of 2017. The Company recorded a tax benefit of \$5,625,000 on the Company's consolidated statement of operations as a result of the sale of the intellectual property.

ASU 2016-16 requires the income tax consequences of intra-entity transfers of assets other than inventory to be recognized when the intra-entity transfer occurs rather than deferring recognition of income tax consequences until the transfer was made with an outside party. The Company adopted the provisions of this ASU in the first quarter of 2018. The adoption resulted in a decrease of \$5,609,000 to other assets, a decrease of \$4,932,000 to deferred tax liabilities and a decrease of \$677,000 to accumulated deficit at January 1, 2018.

At December 31, 2017, the Company had net operating loss carryforwards of approximately \$19,652,000 in the U.S., net operating loss carryforwards of approximately €603,000 (approximately \$743,000) in Germany, federal business tax credit carryforwards of \$297,000 and state business tax credit carryforwards of approximately \$99,000 available to reduce future domestic income taxes, if any. The net operating loss and business tax credits carryforwards will continue to expire at various dates through December 2037. The net operating loss and business tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service. While an IRC Section 382 study was completed in the second quarter of 2017, and no current limitations were identified, use of these net operating loss and business tax credit carryforwards may be limited in the future based on certain changes in the ownership interest of significant stockholders.

On December 22, 2017, the Act was signed into law. The Act made significant changes to federal tax law, including, but not limited to, a reduction in the federal income tax rate from 35% to 21%, taxation of certain global intangible low-taxed income, allowing for immediate expensing of qualified assets, stricter limits on deductions for interest and certain executive compensation, and a one-time transition tax on previously deferred earnings of certain foreign subsidiaries. Due to the complexities involved in accounting for the enactment of the Act, the SEC issued Staff Accounting Bulletin No. 118 ("SAB 118"), which allows a registrant to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. Under the SAB 118 guidance, the Company has determined that although its accounting for the effect of certain provisions of the Act is incomplete, it is able to make reasonable estimates for certain effects of tax reform and therefore have recorded provisional amounts.

The Act lowered the Company's U.S. statutory federal tax rate from 35% to 21% effective January 1, 2018. The Company recorded a tax benefit of \$12,812,000 in the year ended December 31, 2017 for the reduction in its US deferred tax assets and liabilities resulting from the rate change.

The Company is subject to a territorial tax system under the Act, in which the Company is required to provide for tax on GILTI earned by certain foreign subsidiaries. Additionally, the Company is required to make an accounting policy election to either recognize deferred taxes for temporary basis differences expected to reverse as GILTI in future years or provide for the tax expense related to GILTI in the year the tax is incurred as a period expense. As of June 30, 2018, the Company is still evaluating the effects of the GILTI provisions as guidance and interpretations continue to emerge. Therefore, the Company has not determined its accounting policy on the GILTI provisions. However, the standard requires that the Company reflects the impact of the GILTI provisions as a period expense until the accounting policy is finalized. Therefore, the Company has included the provisional estimate of GILTI related to current-year operations in its estimated annual effective tax rate only and will be updating the impact and accounting policy as the analysis related to the GILTI provisions is completed.

The Act also includes a one-time deemed repatriation transition tax whereby entities that are shareholders of a specified foreign corporation must include in gross income the undistributed and previously untaxed post-1986 earnings and profits of the specified foreign corporation. The provisional amount recorded at December 31, 2017 increased the Company's tax provision by \$3,266,000. This amount may change as the Company refines its calculations of post-1986 earnings and profits for our foreign subsidiaries, as well as the amounts held in cash.

The Company anticipates that future guidance and interpretations with respect to the Act will cause the Company to further adjust its provisional amounts recorded as of December 31, 2017. No further adjustments have been made to these provisional amounts in the first quarter of 2018. Any measurement period adjustments will be reported as a component of provision for income taxes in the reporting period the amounts are determined. The final accounting will be completed no later than one year from the enactment of the Act.

The Company's tax returns are subject to examination by federal, state and international tax authorities for the following periods:

<u>Jurisdiction</u>	<u>Fiscal years subject to examination</u>
United States – federal and state	2014-2017
Sweden	2011-2017
Germany	2017
Netherlands	2012-2017

13. Fair Value Measurement

In determining the fair value of its assets and liabilities, the Company uses various valuation approaches. The Company employs a hierarchy for inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that observable inputs be used when available. Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability and are developed based on the best information available in the circumstances. The fair value hierarchy is broken down into three levels based on the source of inputs as follows:

- Level 1 – Valuations based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access
- Level 2 – Valuations based on quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active and models for which all significant inputs are observable, either directly or indirectly
- Level 3 – Valuations based on inputs that are unobservable and significant to the overall fair value measurement

The availability of observable inputs can vary among the various types of financial assets and liabilities. To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, for financial statement disclosure purposes, the level in the fair value hierarchy within which the fair value measurement is categorized is based on the lowest level input that is significant to the overall fair value measurement.

The Company's fixed income investments have historically comprised of obligations of U.S. government agencies and corporate marketable securities. These investments have been initially valued at the transaction price and subsequently valued, at the end of each reporting period, utilizing third party pricing services or other market observable data. The pricing services utilize industry standard valuation models, including both income and market based approaches and observable market inputs to determine value. These observable market inputs include reportable trades, benchmark yields, credit spreads, broker/dealer quotes, bids, offers, current spot rates and other industry and economic events. At least annually, the Company validates applicable prices provided by third party pricing services by reviewing their pricing methods and matrices, obtaining market values from other pricing sources, analyzing pricing data in certain instances and confirming that the relevant markets are active.

As of June 30, 2018 and December 31, 2017, the Company had no assets or liabilities for which fair value measurement is either required or has been elected to be applied.

In May 2016, the Company issued \$115 million aggregate principal amount of the Notes due June 1, 2021. Interest is payable semi-annually in arrears on June 1 and December 1 of each year, beginning December 1, 2016. As of June 30, 2018, the carrying value of the Notes was approximately \$101.3 million, net of unamortized discount, and the fair value of the Notes was approximately \$178.8 million. The fair value of the Notes was determined based on the most recent trade activity of the Notes as of June 30, 2018. These valuations are Level 1 valuations, as the valuations are based on unadjusted quoted prices in active markets that the Company has the ability to access. The Notes are discussed in more detail in Note 10, "Convertible Senior Notes."

There were no re-measurements to fair value during the six-month period ended June 30, 2018 of financial assets and liabilities that are not measured at fair value on a recurring basis.

14. Commitments and Contingencies

The Company leases its headquarters in Waltham, Massachusetts as well as certain of its office and manufacturing space around the world.

In February 2018, the Company entered into an agreement to lease 63,761 square feet of office and manufacturing space in Marlborough, Massachusetts from U.S. REIF 111 Locke Drive Massachusetts, LLC (the “Premises”).

The term of the lease commenced on June 1, 2018 (the “Commencement Date”) and shall continue for a period of 126 consecutive months, unless earlier terminated in accordance with the terms of the lease (the “Lease Term”). Under the lease, the Company has the option to extend the Lease Term for two additional five-year periods.

Fixed rent with respect to 40,000 square feet of the Premises commenced on the Commencement Date, and rent for the full 63,761 square feet of the Premises shall begin 19 months following the Commencement Date. Under the terms of the lease, the Company has provided a letter of credit of approximately \$163,000 as a security deposit and is required to pay its pro rata share of any building operating expenses and real estate taxes.

Future minimum rental commitments under the Company’s leases as of June 30, 2018 are as follows (in thousands):

	Minimum Rental Commitments
2018 (six months remaining)	\$ 1,817
2019	3,643
2020	3,567
2021	3,257
2022	2,050
Thereafter	4,872

15. Related Party Transactions

Certain facilities leased by Spectrum are owned by the former owner of Spectrum, who currently holds greater than 10% of the Company’s outstanding common stock. The lease amounts paid to this shareholder were negotiated in connection with the Spectrum Acquisition. The Company has incurred rent expense totaling \$401,000 for the six-month period ended June 30, 2018 related to these leases.

As part of the Spectrum Acquisition, the Company is responsible for filing all tax returns for Spectrum for the period from January 1, 2017 through July 31, 2017, the day before the Spectrum Acquisition. The Company is responsible for collecting any tax refunds from federal and state authorities and remitting these refunds to the former shareholders of Spectrum, including the former owner of Spectrum who currently holds greater than 10% of the Company’s outstanding common stock. As of June 30, 2018, the Company has accrued \$80,000 of these refunds payable to the Spectrum shareholders. These amounts are included in accrued liabilities on the Company’s consolidated balance sheet.

16. Segment Reporting

The Company views its operations, makes decisions regarding how to allocate resources and manages its business as one operating segment. As a result, the financial information disclosed herein represents all of the material financial information related to the Company’s sole operating segment.

The following table represents the Company’s total revenue by geographic area (based on the location of the customer):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
North America	47%	38%	46%	38%
Europe	41%	50%	42%	52%
Asia and Australia	12%	11%	12%	9%
Other	—	1%	—	1%
Total	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>

Revenue from significant customers as a percentage of the Company's total revenue is as follows:

	Three months ended		Six months ended	
	June 30,		June 30,	
	2018	2017	2018	2017
MilliporeSigma	18%	19%	17%	20%
GE Healthcare	14%	28%	16%	28%

Significant accounts receivable balances as a percentage of the Company's total trade accounts receivable are as follows:

	June 30, 2018	December 31, 2017
GE Healthcare	17%	11%
MilliporeSigma	14%	19%

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

Overview

Repligen and its subsidiaries, collectively doing business as Repligen Corporation ("Repligen", "we", "our", or "the Company") is a leading provider of advanced bioprocessing technology and solutions used in the process of manufacturing biologic drugs. Our products are made to substantially increase biopharmaceutical manufacturing efficiencies and flexibility. As the global biologics market continues to experience strong growth and expansion, our customers – primarily large biopharmaceutical companies and contract manufacturing organizations – face critical production cost, capacity, quality and time pressures that our products are made to address. Our commitment to bioprocessing is helping to set new standards for the way our customers manufacture biologic drugs – monoclonal antibodies, recombinant proteins, vaccines and gene therapies. We are dedicated to inspiring advances in bioprocessing as a trusted partner in the production of biologic drugs that improve human health worldwide.

Prior to 2012, the Company was focused on drug development, with clinical trial costs supported by bioprocessing product sales. At that time our bioprocessing business was largely represented by sales of Protein A ligands, which we sell through long term original equipment manufacturer ("OEM") supply agreements. Our 2011 acquisition of Novozymes Biopharma Sweden AB further expanded our proteins product portfolio and provided the impetus to set a new direction for the company. By mid-2012, we permanently discontinued and have since divested all drug development programs. We retained our proteins OEM business and, through internal innovation and strategic acquisitions, we have built chromatography and filtration product offerings that we sell directly to biologics manufacturers. We continue to seek out strategic opportunities to strengthen and expand our bioprocessing business.

We currently operate as one bioprocessing business, with a comprehensive suite of products to serve both upstream and downstream processes in biologic drug manufacturing. Building on over 35 years of industry expertise, we have developed a broad and diversified product portfolio that reflects our commitment to build a best-in-class bioprocessing technology company with a world-class direct sales and commercial organization.

Our Protein products are represented by our Protein A affinity ligands and cell culture growth factor products. In addition to long-standing OEM supply agreements with GE Healthcare, MilliporeSigma and Purolite Life Sciences for these products, in June 2018 we secured an agreement with Navigo Proteins GmbH for the exclusive co-development of multiple affinity ligands for which Repligen holds commercialization rights. We are manufacturing and have agreed to supply the first of these ligands, NGL-Impact™ A, exclusively to Purolite Life Sciences, who will pair our high performance ligand with their agarose jetting base bead technology used in Purolite's Jetted A50 Protein A resin.

Our direct-to customer Chromatography product line includes a number of products used in the downstream purification and quality control of biological drugs, including a broad range of OPUS® pre-packed chromatography columns, chromatography resins and ELISA test kits.

Our direct-to-customer Filtration product line includes our XCell™ ATF system for use in upstream process intensification, our Sius™ TFF cassettes for use in downstream purification and formulation processes, our KrosFlo® line of hollow fiber cartridges and TFF systems, and our ProConnex® single-use tubing sets. With the addition of Spectrum LifeSciences LLC in August 2017 (the "Spectrum Acquisition"), we now in-house manufacture hollow fiber filters that can be used in our XCell ATF systems and have increased our direct sales presence in Europe and Asia, while diversifying our end markets beyond monoclonal antibodies to include vaccines, recombinant protein and gene therapies.

Critical Accounting Policies and Estimates

A "critical accounting policy" is one which is both important to the portrayal of our financial condition and results and requires management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effect of matters that are inherently uncertain. For additional information, please see the discussion of our critical accounting policies in Management's Discussion and Analysis of Financial Condition and Results of Operations and our significant accounting policies in Note 2 to the Financial Statements included in our Annual Report on Form 10-K for the year ended December 31, 2017.

Results of Operations

Revenues

Product revenues for the three- and six-month periods ended June 30, 2018 and 2017 were as follows:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Product revenue	\$47,743	\$32,434	\$15,309	47.2%	\$92,542	\$63,003	\$29,539	46.9%
Royalty and other revenue	(12)	21	(33)	(157.1%)	19	42	(23)	(54.8%)
Total revenues	<u>\$47,731</u>	<u>\$32,455</u>	<u>\$15,276</u>	47.1%	<u>\$92,561</u>	<u>\$63,045</u>	<u>\$29,516</u>	46.8%

Sales of bioprocessing products increased 47.2% and 46.9% in the three- and six-month periods ended June 30, 2018, respectively, compared to the corresponding periods in the prior year. This increase was primarily due to continued adoption of our products by our key bioprocessing customers and, for the three- and six-month periods of 2018, the addition of revenues following the Spectrum Acquisition. Sales of our bioprocessing products are impacted by the timing of orders, development efforts at our customers or end-users and regulatory approvals for biologics that incorporate our products, which may result in significant quarterly fluctuations. Such quarterly fluctuations are expected, but they may not be predictive of future revenue or otherwise indicate a trend.

Costs and operating expenses

Total costs and operating expenses for the three- and six-month periods ended June 30, 2018 and 2017 were comprised of the following:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Cost of product revenue	\$21,088	\$13,937	\$ 7,151	51.3%	\$40,756	\$27,926	\$12,830	45.9%
Research and development	5,780	1,860	3,920	210.8%	9,068	3,602	5,466	151.7%
Selling, general and administrative	16,590	11,185	5,405	48.3%	32,488	20,367	12,121	59.5%
Total costs and operating expenses	<u>\$43,458</u>	<u>\$26,982</u>	<u>\$16,476</u>	61.1%	<u>\$82,312</u>	<u>\$51,895</u>	<u>\$30,417</u>	58.6%

Cost of product revenue increased 51.3% and 45.9% in the three- and six-month periods ended June 30, 2018, respectively, compared to the corresponding periods in the prior year. This increase is primarily due to the increased product revenues noted above. Gross margins may fluctuate in the third and fourth quarters of 2018 based on expected production volume and product mix.

Research and development expenses increased by 210.8% and 151.7% in the three- and six-month periods ended June 30, 2018, respectively, compared to the corresponding periods in the prior year. This increase is driven by investments made in the second quarter of 2018 to expand our proteins product offerings through our development agreement with Navigo Proteins GmbH. Additionally, the increase is related to product development activities acquired as part of the Spectrum Acquisition and increased activity on our various bioprocessing product development projects.

Selling, general and administrative expenses increased 48.3% and 59.5% in the three- and six-month periods ended June 30, 2018, respectively, compared to the corresponding periods in the prior year. This increase is due to selling and administrative activities incurred following the Spectrum Acquisition, as well as the continued buildout of our administrative infrastructure to support future growth and continued expansion of our customer-facing activities to drive sales of our bioprocessing products.

Investment income

Investment income for the three- and six-month periods ended June 30, 2018 and 2017 was as follows:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Investment income	\$512	\$110	\$ 402	365.5%	\$693	\$206	\$ 487	236.4%

Investment income includes income earned on invested cash balances. The increase in investment income in the three- and six-month periods ended June 30, 2018 compared to the corresponding prior year periods is attributable to higher average invested cash balances and higher interest rates on such cash balances.

Interest expense

Interest expense for the three- and six-month periods ended June 30, 2018 and 2017 was as follows:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Interest expense	\$(1,669)	\$(1,601)	\$ (68)	4.2%	\$(3,321)	\$(3,187)	\$ (134)	4.2%

Increases in interest expense in the three- and six-month periods ended June 30, 2018, respectively, compared to the corresponding periods in the prior year are attributable to interest expense related to the issuance of convertible senior notes in May 2016.

Other income (expense)

Other income (expense) for the three- and six-month periods ended June 30, 2018 and 2017 was as follows:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Other income (expense)	\$251	\$(328)	\$ 579	(176.5%)	\$321	\$(448)	\$ 769	(171.7)%

Changes in other income (expense) in the three- and six-month periods ended June 30, 2018, respectively, compared to the corresponding periods in the prior year are primarily attributable to foreign currency gains and losses related to amounts due from non-Swedish kronor-based customers and cash balances denominated in U.S. dollars and British pounds held by Repligen Sweden AB.

Income tax (benefit) provision

Income tax (benefit) provision for the three- and six-month periods ended June 30, 2018 and 2017 was as follows:

(in thousands, except percentages)	Three months ended June 30,				Six months ended June 30,			
	2018	2017	\$ Change	% Change	2018	2017	\$ Change	% Change
Income tax (benefit) provision	\$629	\$(4,784)	\$ 5,413	(113.1%)	\$1,757	\$(3,785)	\$ 5,542	(146.4)%

For the three- and six-month periods ended June 30, 2018, we had income before taxes of \$3,367,000 and \$7,942,000, respectively, and recorded a tax provision of \$629,000 and \$1,757,000, respectively. The effective tax rate was 18.7% and 22.1% for the three- and six-month periods ended June 30, 2018, respectively, and is based upon the estimated income for the year and the composition of the income in different jurisdictions. The effective tax rate for the three-month period ended June 30, 2018 was lower than the U.S. statutory rate of 21% due to R&D credit activity and windfall benefits on stock option exercises and restricted stock vestings, partially offset by state tax effects and the impact of the Global Intangible Low-Taxed Income (“GILTI”) tax enacted as part of the Tax Cuts and Jobs Act (the “Act”) enacted in December 2017. The effective tax rate for the six-month period ended June 30, 2018 was higher than the U.S. statutory tax rate of 21% due to state tax effects and the impact of the GILTI tax.

For the three- and six-month periods ended June 30, 2017, we had income before taxes of \$3,654,000 and \$7,721,000, respectively, and recorded a tax benefit of (\$4,784,000) and (\$3,785,000), respectively. The effective tax rate was (130.9%) and (49.0%) for the three- and six-month periods ended June 30, 2017, respectively, and is based upon the estimated income for the year and the composition of the income in different jurisdictions. The effective tax rate was lower than the U.S. statutory tax rate of 34% primarily due to a benefit of approximately \$5,625,000 related to the reduction of the Company’s valuation allowance on its deferred tax assets resulting from the sale of certain intellectual property from Repligen Corporation to Repligen Sweden AB in the second quarter of 2017.

Non-GAAP Financial Measures

We provide non-GAAP adjusted income from operations; adjusted net income; and adjusted EBITDA as supplemental measures to GAAP measures regarding our operating performance. These financial measures exclude the items detailed below and, therefore, have not been calculated in accordance with GAAP. A detailed explanation and a reconciliation of each non-GAAP financial measure to its most comparable GAAP financial measure is provided below.

We include this financial information because we believe these measures provide a more accurate comparison of our financial results between periods and more accurately reflect how management reviews its financial results. We excluded the impact of certain acquisition-related items because we believe that the resulting charges do not accurately reflect the performance of our ongoing operations for the period in which such charges are incurred.

Adjusted Income from Operations

Adjusted income from operations is measured by taking income from operations as reported in accordance with GAAP and excluding acquisition and integration costs, amortization of intangible assets and inventory step-up charges booked through our consolidated statements of comprehensive income. The following is a reconciliation of income from operations in accordance with GAAP to adjusted income from operations for the three- and six-month periods ended June 30, 2018 and 2017 (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
GAAP income from operations	\$ 4,273	\$ 5,473	\$ 10,249	\$ 11,150
Adjustments to income from operations:				
Acquisition and integration costs	853	2,385	1,508	2,787
Intangible amortization	2,634	769	5,298	1,484
Inventory step-up charges	—	—	—	224
Adjusted income from operations	<u>\$ 7,760</u>	<u>\$ 8,627</u>	<u>\$ 17,055</u>	<u>\$ 15,645</u>

Adjusted Net Income

Adjusted net income is measured by taking net income as reported in accordance with GAAP and excluding acquisition and integration costs and related tax effects, amortization of intangible assets and related tax effects, inventory step-up charges and non-cash interest expense booked through our consolidated statements of comprehensive income. The following is a reconciliation of net income in accordance with GAAP to adjusted net income for the three-month periods ended June 30, 2018 and 2017:

	Three Months Ended June 30,			
	2018		2017	
	(in thousands) Amount	Fully Diluted Earnings per Share	(in thousands) Amount	Fully Diluted Earnings per Share
GAAP net income	\$ 2,738	\$ 0.06	\$ 8,438	\$ 0.24
Adjustments to net income:				
Acquisition and integration costs	853	0.02	2,385	0.07
Intangible amortization	2,634	0.06	769	0.02
Inventory step-up charges	—	—	—	—
Non-cash interest expense	1,053	0.02	986	0.03
Tax effect of intangible amortization and acquisition and integration costs	(260)	(0.01)	(103)	(0.00)
Release of valuation allowance on deferred tax assets	—	—	(5,625)	(0.16)
Adjusted net income	<u>\$ 7,018</u>	<u>\$ 0.16</u>	<u>\$ 6,850</u>	<u>\$ 0.20</u>

Per share totals may not add due to rounding.

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The following is a reconciliation of net income in accordance with GAAP to non-GAAP adjusted net income for the six-month periods ended June 30, 2018 and 2017:

	Six Months Ended June 30,			
	2018		2017	
	(in thousands) Amount	Fully Diluted Earnings per Share	(in thousands) Amount	Fully Diluted Earnings per Share
GAAP net income	\$ 6,185	\$ 0.14	\$ 11,506	\$ 0.33
Adjustments to net income:				
Acquisition and integration costs	1,508	0.03	2,787	0.08
Intangible amortization	5,298	0.12	1,484	0.04
Inventory step-up charges	—	—	224	0.01
Non-cash interest expense	2,089	0.05	1,956	0.06
Tax effect of intangible amortization and acquisition and integration costs	(531)	(0.01)	(204)	(0.01)
Release of valuation allowance on deferred tax assets	—	—	(5,625)	(0.16)
Adjusted net income	<u>\$ 14,549</u>	<u>\$ 0.33</u>	<u>\$ 12,128</u>	<u>\$ 0.35</u>

Adjusted EBITDA

Adjusted EBITDA is measured by taking net income as reported in accordance with GAAP, excluding investment income, interest expense, taxes, depreciation and amortization, and excluding acquisition and integration costs and inventory step-up charges booked through our consolidated statements of comprehensive income. The following is a reconciliation of net income in accordance with GAAP to adjusted EBITDA for the three- and six-month periods ended June 30, 2018 and 2017 (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
GAAP net income	\$ 2,738	\$ 8,438	\$ 6,185	\$ 11,506
Adjustments to net income:				
Investment income	(512)	(110)	(693)	(206)
Interest expense	1,669	1,601	3,321	3,187
Tax provision	629	(4,784)	1,757	(3,785)
Depreciation	1,314	929	2,598	1,858
Amortization	2,634	769	5,298	1,484
EBITDA	8,472	6,843	18,466	14,044
Other adjustments:				
Acquisition and integration costs	853	2,385	1,508	2,787
Inventory step-up charges	—	—	—	224
Adjusted EBITDA	<u>\$ 9,325</u>	<u>\$ 9,228</u>	<u>\$ 19,974</u>	<u>\$ 17,055</u>

Liquidity and Capital Resources

We have financed our operations primarily through revenues derived from product sales, research grants, proceeds and royalties from license arrangements, sales of equity securities and issuance of convertible debt. Our revenue for the foreseeable future will primarily be limited to our bioprocessing product revenue.

At June 30, 2018, we had cash and cash equivalents of \$175,611,000 compared to cash and cash equivalents of \$173,759,000 at December 31, 2017.

Operating activities

For the six-month period ended June 30, 2018, our operating activities provided cash of \$7,535,000 reflecting net income of \$6,185,000 and non-cash charges totaling \$15,202,000 primarily related to depreciation, amortization, non-cash interest expense, deferred tax expense and stock-based compensation charges. An increase in accounts receivable consumed \$4,788,000 of cash, and was primarily driven by the 47% year-to-date increase in revenues. An increase in inventory consumed \$3,096,000 of cash, related to

increasing inventory levels to accommodate future revenue growth. Payments of accounts payable and accrued liabilities consumed \$4,686,000 of cash, and were mainly due to the timing of payments of payables and payment of 2017 incentive compensation programs. The remaining cash flow used in operations resulted from net unfavorable changes in various other working capital accounts.

For the six-month period ended June 30, 2017, our operating activities provided cash of \$3,961,000 reflecting net income of \$11,506,000 and non-cash charges totaling \$2,941,000 primarily related to depreciation, amortization, non-cash interest expense, deferred tax expense and stock-based compensation charges. An increase in accounts receivable consumed \$6,347,000 of cash, and was primarily due to the increase in revenues and timing of cash receipts from customers. An increase in inventories consumed \$813,000 of cash to support future revenues. An increase in accounts payable provided \$1,740,000 of cash, which was primarily due to the timing of purchases and payments to vendors. Payments of accrued liabilities consumed \$4,216,000 of cash, and were mainly due to the payment of contingent consideration to Refine and Atoll related to 2016 sales milestones. The remaining cash flow provided by operations resulted from net unfavorable changes in various other working capital accounts.

Investing activities

Our investing activities consumed \$4,412,000 of cash related to capital expenditures for the six-month period ended June 30, 2018. Our investing activities provided \$14,132,000 for the six-month period ended June 30, 2017, primarily due to net redemptions of marketable securities of \$16,808,000 offset by \$2,676,000 used for fixed asset additions.

Financing activities

For the six-month period ended June 30, 2018, our financing activities provided \$1,479,000 of cash. We received proceeds of \$1,490,000 from stock option exercises, partially offset by cash outlays of \$11,000 related to the conversion of certain convertible senior notes in the first quarter of 2018. For the six-month period ended June 30, 2017, our financing activities used \$172,000 of cash. We made contingent consideration payments of \$1,677,000 related to the initial valuation of the likelihood that the 2016 XCell™ ATF sales milestones and Atoll revenue growth milestones would be achieved. These payments were partially offset by proceeds from stock option exercises totaling \$1,505,000.

We do not currently use derivative financial instruments.

Working capital decreased by approximately \$85,781,000 to \$131,790,000 at June 30, 2018 from \$217,571,000 at December 31, 2017 due to the various changes noted above.

Our future capital requirements will depend on many factors, including the following:

- the expansion of our bioprocessing business;
- our identification and execution of strategic acquisitions or business combinations;
- the ability to sustain sales and profits of our bioprocessing products;
- market acceptance of our new products;
- our ability to acquire additional bioprocessing products;
- the resources required to successfully integrate our recently acquired businesses and recognize expected synergies;
- the scope of and progress made in our research and development activities;
- the extent of any share repurchase activity;
- the election of any Note holders to convert their Notes during an eligible period; and
- the success of any proposed financing efforts.

Absent acquisitions of additional businesses, products, product candidates or intellectual property, we believe our current cash balances are adequate to meet our cash needs for at least twelve months from the date of this filing. We expect operating expenses to increase as we integrate Spectrum into our business, continue to develop and expand our bioprocessing product lines and expand our commercial capabilities for the foreseeable future. Our future capital requirements may include, but are not limited to, purchases of property, plant and equipment, the acquisition of additional bioprocessing products and technologies to complement our existing manufacturing capabilities, continued investment in our intellectual property portfolio and future repayment of convertible debt.

We plan to continue to invest in our bioprocessing business and in key research and development activities associated with the development of new bioprocessing products. We actively evaluate various strategic transactions on an ongoing basis, including monetizing existing assets and licensing or acquiring complementary products, technologies or businesses that would complement our

existing portfolio of development programs. We continue to seek to acquire such potential assets that may offer us the best opportunity to create value for our shareholders. In order to acquire such assets, we may need to seek additional financing to fund these investments. This may require the issuance or sale of additional equity or debt securities. The sale of additional equity may result in additional dilution to our stockholders. Should we need to secure additional financing to acquire a product, fund future investment in research and development, or meet our future liquidity requirements, we may not be able to secure such financing, or obtain such financing on favorable terms because of the volatile nature of the biotechnology marketplace.

Contractual Obligations and Commitments

In February 2018, we entered into an agreement to lease 63,761 square feet of office and manufacturing space in Marlborough, Massachusetts from U.S. REIF 111 Locke Drive Massachusetts, LLC (the “Premises”).

The lease commences during the second quarter of 2018 (the “Commencement Date”) and shall continue for a period of 126 consecutive months, unless earlier terminated in accordance with the terms of the lease (the “Lease Term”). Under the lease, the Company has the option to extend the Lease Term for two additional five-year periods.

Fixed rent with respect to 40,000 square feet of the Premises only shall commence on the Commencement Date, and rent for the full 63,761 square feet of the Premises shall begin 19 months following the Commencement Date. Under the terms of the lease, the Company has provided a letter of credit of approximately \$163,000 as a security deposit and is required to pay its pro rata share of any building operating expenses and real estate taxes.

Other than the lease detailed above, there were no material changes to our contractual obligations during the three- and six-month periods ended June 30, 2018. For a complete discussion of our contractual obligations, please refer to our *Management’s Discussion and Analysis of Financial Condition and Results of Operations* in our Annual Report on Form 10-K for the year ended December 31, 2017.

Off-Balance Sheet Arrangements

We do not have any special purpose entities or off-balance sheet financing arrangements as of June 30, 2018.

Cautionary Statement Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q contains forward-looking statements which are made pursuant to the safe harbor provisions of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). The forward-looking statements in this Quarterly Report on Form 10-Q do not constitute guarantees of future performance. Investors are cautioned that statements in this Quarterly Report on Form 10-Q which are not strictly historical statements, including, without limitation, express or implied statements or guidance regarding current or future financial performance and position, potential impairment of future earnings, management’s strategy, plans and objectives for future operations or acquisitions, product development and sales, agreements with our current or potential customers, product candidate research, development and regulatory approval, selling, general and administrative expenditures, intellectual property, development and manufacturing plans, availability of materials and product and adequacy of capital resources, repayment of our convertible senior notes and financing plans constitute forward-looking statements. Such forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from those anticipated, including, without limitation, risks associated with: the success of current and future collaborative or supply relationships, including our agreements with GE Healthcare and MilliporeSigma, our ability to successfully grow our bioprocessing business, including as a result of acquisitions, commercialization or partnership opportunities, and our ability to develop and commercialize products, our ability to obtain required regulatory approvals, our compliance with all Food and Drug Administration regulations, our ability to obtain, maintain and protect intellectual property rights for our products, the risk of litigation regarding our patent and other intellectual property rights, the risk of litigation with collaborative partners, our limited manufacturing capabilities and our dependence on third-party manufacturers and value-added resellers, our ability to hire and retain skilled personnel, the market acceptance of our products, reduced demand for our products that adversely impacts our future revenues, cash flows, results of operations and financial condition, our ability to compete with larger, better financed life sciences companies, our history of losses and expectation of incurring losses, our ability to generate future revenues, our ability to successfully integrate our recently acquired businesses, our ability to raise additional capital to fund potential acquisitions, our volatile stock price, and the effects of our anti-takeover provisions. Further information on potential risk factors that could affect our financial results are included in the filings made by us from time to time with the Securities and Exchange Commission including under the section entitled “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2017.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest rate risk

We have historically invested funds in U.S. Government and agency securities. As a result, we have been exposed to potential loss from market risks that may occur as a result of changes in interest rates, changes in credit quality of the issuer or otherwise. As of June 30, 2018, we do not have any such investments; however, we may seek to invest funds in similar investment vehicles in the future, as specified in our investment policy guidelines. Our investment policy limits the amount of our credit exposure to any one issuer, (with the exception of U.S. government and agency securities) and type of instrument.

Foreign exchange risk

The reporting currency of the Company is U.S. dollars, and the functional currency of each of our foreign subsidiaries is its respective local currency. Our foreign currency exposures include the Swedish kronor, Euro, British pound, Chinese yuan, Japanese yen, Singapore dollar, South Korean won and Indian rupee; of these, the primary foreign currency exposures are the Swedish kronor, Euro and British pound. Exchange gains or losses resulting from the translation between the transactional currency and the functional currency are included in net income. Fluctuations in exchange rates may adversely affect our results of operations, financial position and cash flows. We currently do not seek to hedge this exposure to fluctuations in exchange rates.

ITEM 4. CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

The Company's management, with the participation of the principal executive officer and the principal financial officer, has evaluated the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) or 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) as of the end of the period covered by this report. Based on such evaluation, the principal executive officer and principal financial officer have concluded that, as of the end of such period, the Company's disclosure controls and procedures were effective in ensuring that information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, on a timely basis, and is accumulated and communicated to the Company's management, including the Company's principal executive officer and the Company's principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control

We acquired Spectrum LifeSciences, LLC ("Spectrum") in August 2017. The financial results of Spectrum are included in our consolidated financial statements as of and for the three- and six-month periods ended June 30, 2018. Spectrum represented approximately \$36,331,000 of our total assets as of June 30, 2018 and \$24,031,000 of revenues for the six-month period ended June 30, 2018. As this acquisition occurred during the second half of 2017, the scope of our assessment of our internal control over financial reporting does not include Spectrum. This exclusion is in accordance with the SEC's general guidance that an assessment of a recently acquired business may be omitted from our scope in the year of acquisition. We are actively reviewing and updating Spectrum's internal control policies and procedures, and management will include Spectrum in its report on internal control over financial reporting as of and for the year ended December 31, 2018.

Effective January 1, 2018, we adopted the provisions of ASC 606, "Revenue from Contracts with Customers." As part of the adoption of this standard, we reviewed our control procedures and have modified certain of our processes to ensure compliance with the new standard.

Other than the foregoing, there have been no changes in our internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Securities Exchange Act Rule 13a-15 or Rule 15d-15 that occurred in the three months ended June 30, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

From time to time, we may be subject to legal proceedings and claims in the ordinary course of business. We are not currently aware of any such proceedings or claims that we believe will have, individually or in the aggregate, a material adverse effect on our business, financial condition or results of operations.

ITEM 1A. RISK FACTORS

The matters discussed in this Quarterly Report on Form 10-Q include forward-looking statements that involve risks or uncertainties. These statements are neither promises nor guarantees, but are based on various assumptions by management regarding future circumstances, over many of which Repligen has little or no control. A number of important risks and uncertainties, including those identified under the caption “Risk Factors” in Item 1A in our Annual Report on Form 10-K for the year ended December 31, 2017 and subsequent filings, could cause our actual results to differ materially from those in the forward-looking statements. There are no material changes to the Risk Factors described in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017.

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

At our 2018 Annual Meeting of Stockholders held on May 16, 2018, our stockholders approved the Repligen Corporation 2018 Stock Option and Incentive Plan (the “2018 Plan”), which was previously approved by our board of directors on April 3, 2018. The 2018 Plan provides for the grant of equity awards for up to an aggregate of 2,778,000 shares of our common stock, plus the number of shares of stock available for issuance under our Amended and Restated 2012 Stock Option and Incentive Plan. A summary of the material terms and conditions of the 2018 Plan is set forth in our definitive proxy statement on Schedule 14A filed with the Securities and Exchange Commission on April 20, 2018, as amended (the “Proxy Statement”). The full text of the 2018 Plan is filed as Annex B to the Proxy Statement and is incorporated by reference as Exhibit 10.1 to this Quarterly Report on Form 10-Q.

ITEM 6. EXHIBITS

(a) Exhibits

<u>Exhibit Number</u>	<u>Document Description</u>
3.1	Restated Certificate of Incorporation, dated September 30, 1992 and amended September 17, 1999 (filed as Exhibit 3.1 to Repligen Corporation’s Quarterly Report on Form 10-Q for the quarter ended September 30, 1999 and incorporated herein by reference).
3.2	Certificate of Amendment to the Certificate of Incorporation of Repligen Corporation, effective as of May 16, 2014 (filed as Exhibit 3.1 to Repligen Corporation’s Current Report on Form 8-K filed on May 19, 2014 and incorporated herein by reference).
3.3	Second Amended and Restated Bylaws (filed as Exhibit 3.1 to Repligen Corporation’s Current Report on Form 8-K filed on May 23, 2017 and incorporated herein by reference).

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<u>Exhibit Number</u>	<u>Document Description</u>
10.1 +	2018 Repligen Corporation Stock Option and Incentive Plan.
31.1 +	Rule 13a-14(a)/15d-14(a) Certification.
31.2 +	Rule 13a-14(a)/15d-14(a) Certification.
32.1 *	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101+	The following materials from Repligen Corporation on Form 10-Q for the quarterly period ended June 30, 2018, formatted in Extensible Business Reporting Language (xBRL): (i) Condensed Consolidated Statements of Comprehensive Income (Loss), (ii) Condensed Consolidated Balance Sheets, (iii) Condensed Consolidated Statements of Cash Flows, and (iv) Notes to Condensed Consolidated Financial Statements, tagged as blocks of text.
+	Filed herewith.
*	Furnished herewith.

SIGNATURES

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

REPLIGEN CORPORATION

Date: August 2, 2018

By: / s / T O N Y J. H U N T
Tony J. Hunt
President and Chief Executive Officer
(Principal executive officer)
Repligen Corporation

Date: August 2, 2018

By: _____ / s / J O N S N O D G R E S
Jon Snodgres
Chief Financial Officer
(Principal financial officer)
Repligen Corporation

REPLIGEN CORPORATION

2018 STOCK OPTION AND INCENTIVE PLAN

SECTION 1. GENERAL PURPOSE OF THE PLAN; DEFINITIONS

The name of the plan is the Repligen Corporation 2018 Stock Option and Incentive Plan (the “Plan”). The purpose of the Plan is to encourage and enable the officers, employees, Non-Employee Directors and Consultants of Repligen Corporation (the “Company”) and its Subsidiaries upon whose judgment, initiative and efforts the Company largely depends for the successful conduct of its business to acquire a proprietary interest in the Company. It is anticipated that providing such persons with a direct stake in the Company’s welfare will assure a closer identification of their interests with those of the Company and its stockholders, thereby stimulating their efforts on the Company’s behalf and strengthening their desire to remain with the Company.

The following terms shall be defined as set forth below:

“*Act*” means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

“*Administrator*” means either the Board or the compensation committee of the Board or a similar committee performing the functions of the compensation committee and which is comprised of not less than two Non-Employee Directors who are independent.

“*Award*” or “*Awards*,” except where referring to a particular category of grant under the Plan, shall include Incentive Stock Options, Non-Qualified Stock Options, Stock Appreciation Rights, Restricted Stock Units, Restricted Stock Awards, Unrestricted Stock Awards, Cash-Based Awards, and Dividend Equivalent Rights.

“*Award Certificate*” means a written or electronic document setting forth the terms and provisions applicable to an Award granted under the Plan. Each Award Certificate is subject to the terms and conditions of the Plan.

“*Board*” means the Board of Directors of the Company.

“*Cash-Based Award*” means an Award entitling the recipient to receive a cash-denominated payment.

“*Code*” means the Internal Revenue Code of 1986, as amended, and any successor Code, and related rules, regulations and interpretations.

“*Consultant*” means any natural person that provides bona fide services to the Company, within the meaning of Form S-8 promulgated under the Securities Act, and provided, further, that a Consultant will include only those persons to whom the issuance of Shares may be registered under Form S-8 promulgated under the Securities Act.

“Dividend Equivalent Right” means an Award entitling the grantee to receive credits based on cash dividends that would have been paid on the shares of Stock specified in the Dividend Equivalent Right (or other award to which it relates) if such shares had been issued to and held by the grantee.

“Effective Date” means the date on which the Plan becomes effective as set forth in Section 19.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

“Fair Market Value” of the Stock on any given date means the fair market value of the Stock determined in good faith by the Administrator; provided, however, that if the Stock is admitted to quotation on the National Association of Securities Dealers Automated Quotation System (“NASDAQ”), NASDAQ Global Market, the New York Stock Exchange or another national securities exchange, the determination shall be made by reference to the closing price of the Stock on such exchange. If there is no closing price for such date, the determination shall be made by reference to the last date preceding such date for which there is a closing price.

“Incentive Stock Option” means any Stock Option designated and qualified as an “incentive stock option” as defined in Section 422 of the Code.

“Minimum Vesting Period” means the one-year period following the date of grant of an Award.

“Non-Employee Director” means a member of the Board who is not also an employee of the Company or any Subsidiary.

“Non-Qualified Stock Option” means any Stock Option that is not an Incentive Stock Option.

“Option” or *“Stock Option”* means any option to purchase shares of Stock granted pursuant to Section 5.

“Restricted Shares” means the shares of Stock underlying a Restricted Stock Award that remain subject to a risk of forfeiture or the Company’s right of repurchase.

“Restricted Stock Award” means an Award of Restricted Shares subject to such restrictions and conditions as the Administrator may determine at the time of grant.

“Restricted Stock Units” means an Award of stock units subject to such restrictions and conditions as the Administrator may determine at the time of grant.

“Sale Event” means (i) the sale of all or substantially all of the assets of the Company on a consolidated basis to an unrelated person or entity, (ii) a merger, reorganization or consolidation pursuant to which the holders of the Company’s outstanding voting power immediately prior to such transaction do not own a majority of the outstanding voting power of the resulting or successor entity (or its ultimate parent, if applicable) immediately upon

completion of such transaction, (iii) the sale of all of the Stock of the Company to an unrelated person, entity or group thereof acting in concert, or (iv) any other transaction in which the owners of the Company's outstanding voting power immediately prior to such transaction do not own at least a majority of the outstanding voting power of the Company or any successor entity immediately upon completion of the transaction other than as a result of the acquisition of securities directly from the Company.

"*Sale Price*" means the value as determined by the Administrator of the consideration payable, or otherwise to be received by stockholders, per share of Stock pursuant to a Sale Event.

"*Section 409A*" means Section 409A of the Code and the regulations and other guidance promulgated thereunder.

"*Service Relationship*" means any relationship as a full-time employee, part-time employee, director or Consultant of the Company or any Subsidiary or any successor entity (e.g., a Service Relationship shall be deemed to continue without interruption in the event an individual's status changes from full-time employee to part-time employee or Consultant).

"*Stock*" means the Common Stock, par value \$0.01 per share, of the Company, subject to adjustments pursuant to Section 3.

"*Stock Appreciation Right*" means an Award entitling the recipient to receive shares of Stock (or cash, to the extent explicitly provided for in the applicable Award Certificate) having a value equal to the excess of the Fair Market Value of the Stock on the date of exercise over the exercise price of the Stock Appreciation Right multiplied by the number of shares of Stock with respect to which the Stock Appreciation Right shall have been exercised.

"*Subsidiary*" means any corporation or other entity (other than the Company) in which the Company has at least a 50 percent interest, either directly or indirectly.

"*Ten Percent Owner*" means an employee who owns or is deemed to own (by reason of the attribution rules of Section 424(d) of the Code) more than 10 percent of the combined voting power of all classes of stock of the Company or any parent or subsidiary corporation.

"*Unrestricted Stock Award*" means an Award of shares of Stock free of any restrictions.

SECTION 2. ADMINISTRATION OF PLAN; ADMINISTRATOR AUTHORITY TO SELECT GRANTEES AND DETERMINE AWARDS

(a) Administration of Plan. The Plan shall be administered by the Administrator.

(b) Powers of Administrator. The Administrator shall have the power and authority to grant Awards consistent with the terms of the Plan, including the power and authority:

- (i) to select the individuals to whom Awards may from time to time be granted;

(ii) to determine the time or times of grant, and the extent, if any, of Incentive Stock Options, Non-Qualified Stock Options, Stock Appreciation Rights, Restricted Stock Awards, Restricted Stock Units, Unrestricted Stock Awards, Cash-Based Awards, and Dividend Equivalent Rights, or any combination of the foregoing, granted to any one or more grantees;

(iii) to determine the number of shares of Stock to be covered by any Award;

(iv) Subject to Section 2(d), to determine and modify from time to time the terms and conditions, including restrictions, not inconsistent with the terms of the Plan, of any Award, which terms and conditions may differ among individual Awards and grantees, and to approve the forms of Award Certificates;

(v) to accelerate at any time the exercisability or vesting of all or any portion of any Award in circumstances involving the grantee's death or disability, retirement or termination of employment or a change in control (including a Sale Event);

(vi) subject to the provisions of Section 5(c), to extend at any time the period in which Stock Options may be exercised; and

(vii) at any time to adopt, alter and repeal such rules, guidelines and practices for administration of the Plan and for its own acts and proceedings as it shall deem advisable; to interpret the terms and provisions of the Plan and any Award (including related written instruments); to make all determinations it deems advisable for the administration of the Plan; to decide all disputes arising in connection with the Plan; and to otherwise supervise the administration of the Plan.

All decisions and interpretations of the Administrator shall be binding on all persons, including the Company and Plan grantees.

(c) Delegation of Authority to Grant Awards. Subject to applicable law, the Administrator, in its discretion, may delegate to a committee consisting of one or more officers of the Company, including the Chief Executive Officer of the Company, all or part of the Administrator's authority and duties with respect to the granting of Awards to individuals who are (i) not subject to the reporting and other provisions of Section 16 of the Exchange Act and (ii) not members of the delegated committee. Any such delegation by the Administrator shall include a limitation as to the amount of Stock underlying Awards that may be granted during the period of the delegation and shall contain guidelines as to the determination of the exercise price and the vesting criteria. The Administrator may revoke or amend the terms of a delegation at any time but such action shall not invalidate any prior actions of the Administrator's delegate or delegates that were consistent with the terms of the Plan.

(d) Minimum Vesting Period. The vesting period for each Award granted under the Plan must be at least equal to the Minimum Vesting Period; provided, however, nothing in this Section 2(d) shall limit the Administrator's authority to accelerate the vesting of Awards as set forth in Section 2(b)(v) above; and, provided further, notwithstanding the foregoing, up to 5% of the shares of Stock authorized for issuance under the Plan may be utilized for Unrestricted Stock Awards or other Awards with a vesting period that is less than the Minimum Vesting Period (each such Award, an "Excepted Award"). Notwithstanding the foregoing, in addition to

Excepted Awards, the Administrator may grant Awards that vest (or permit previously granted Awards to vest) within the Minimum Vesting Period (i) if such Awards are granted as substitute Awards in replacement of other Awards (or awards previously granted by an entity being acquired (or assets of which are being acquired)) that were scheduled to vest within the Minimum Vesting Period or (ii) if such Awards are being granted in connection with an elective deferral of cash compensation that, absent a deferral election, otherwise would have been paid to the grantee within the Minimum Vesting Period. In addition, notwithstanding the foregoing, annual Awards to Non-Employee Directors that occur in connection with the Company's annual meeting of stockholders may vest on the date of the Company's next annual meeting of stockholders.

(e) Award Certificate. Awards under the Plan shall be evidenced by Award Certificates that set forth the terms, conditions and limitations for each Award which may include, without limitation, the term of an Award and the provisions applicable in the event employment or Service Relationship terminates.

(f) Indemnification. Neither the Board nor the Administrator, nor any member of either or any delegate thereof, shall be liable for any act, omission, interpretation, construction or determination made in good faith in connection with the Plan, and the members of the Board and the Administrator (and any delegate thereof) shall be entitled in all cases to indemnification and reimbursement by the Company in respect of any claim, loss, damage or expense (including, without limitation, reasonable attorneys' fees) arising or resulting therefrom to the fullest extent permitted by law and/or under the Company's articles or bylaws or any directors' and officers' liability insurance coverage which may be in effect from time to time and/or any indemnification agreement between such individual and the Company.

(g) Foreign Award Recipients. Notwithstanding any provision of the Plan to the contrary, in order to comply with the laws in other countries in which the Company and its Subsidiaries operate or have employees or other individuals eligible for Awards, the Administrator, in its sole discretion, shall have the power and authority to: (i) determine which Subsidiaries shall be covered by the Plan; (ii) determine which individuals outside the United States are eligible to participate in the Plan; (iii) modify the terms and conditions of any Award granted to individuals outside the United States to comply with applicable foreign laws; (iv) establish subplans and modify exercise procedures and other terms and procedures, to the extent the Administrator determines such actions to be necessary or advisable (and such subplans and/or modifications shall be attached to this Plan as appendices); provided, however, that no such subplans and/or modifications shall increase the share limitations contained in Section 3(a) hereof; and (v) take any action, before or after an Award is made, that the Administrator determines to be necessary or advisable to obtain approval or comply with any local governmental regulatory exemptions or approvals. Notwithstanding the foregoing, the Administrator may not take any actions hereunder, and no Awards shall be granted, that would violate the Exchange Act or any other applicable United States securities law, the Code, or any other applicable United States governing statute or law.

SECTION 3. STOCK ISSUABLE UNDER THE PLAN; MERGERS; SUBSTITUTION

(a) Stock Issuable. The maximum number of shares of Stock reserved and available for issuance under the Plan shall be 2,778,000 shares plus the number of shares of Stock available for issuance under the Company's Amended and Restated 2012 Stock Option and Incentive Plan (the "2012 Plan"), as of the Effective Date, subject to adjustment as provided in this Section 3. For purposes of this limitation, the shares of Stock underlying any awards under the Plan and the 2012 Plan that are forfeited, canceled or otherwise terminated (other than by exercise) shall be added back to the shares of Stock available for issuance under the Plan. Notwithstanding the foregoing, the following shares shall not be added to the shares authorized for grant under the Plan:

(i) shares tendered or held back upon exercise of a Stock Option or settlement of an Award to cover the exercise price or tax withholding, and (ii) shares subject to a Stock Appreciation Right that are not issued in connection with the stock settlement of the Stock Appreciation Right upon exercise thereof. In the event the Company repurchases shares of Stock on the open market, such shares shall not be added to the shares of Stock available for issuance under the Plan. Subject to such overall limitations, shares of Stock may be issued up to such maximum number pursuant to any type or types of Award; provided, however, that no more than 4,000,000 shares of the Stock may be issued in the form of Incentive Stock Options. The shares available for issuance under the Plan may be authorized but unissued shares of Stock or shares of Stock reacquired by the Company.

(b) Maximum Awards to Non-Employee Directors. Notwithstanding anything to the contrary in this Plan, the value of all Awards awarded under this Plan and all other cash compensation paid by the Company to any Non-Employee Director in any calendar year shall not exceed \$500,000. For the purpose of this limitation, the value of any Award shall be its grant date fair value, as determined in accordance with ASC 718 or successor provision but excluding the impact of estimated forfeitures related to service-based vesting provisions.

(c) Changes in Stock. Subject to Section 3(d) hereof, if, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Company's capital stock, the outstanding shares of Stock are increased or decreased or are exchanged for a different number or kind of shares or other securities of the Company, or additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such shares of Stock or other securities, or, if, as a result of any merger or consolidation, sale of all or substantially all of the assets of the Company, the outstanding shares of Stock are converted into or exchanged for securities of the Company or any successor entity (or a parent or subsidiary thereof), the Administrator shall make an appropriate or proportionate adjustment in (i) the maximum number of shares reserved for issuance under the Plan, including the maximum number of shares that may be issued in the form of Incentive Stock Options, (ii) the number and kind of shares or other securities subject to any then outstanding Awards under the Plan, (iii) the repurchase price, if any, per share subject to each outstanding Restricted Stock Award, and (iv) the exercise price for each share subject to any then outstanding Stock Options and Stock Appreciation Rights under the Plan, without changing the aggregate exercise price (i.e., the exercise price multiplied by the number of Stock Options and Stock Appreciation Rights) as to which such Stock Options and Stock Appreciation Rights remain exercisable. The Administrator shall also make equitable or proportionate adjustments in the number of shares subject to outstanding Awards and the

exercise price and the terms of outstanding Awards to take into consideration cash dividends paid other than in the ordinary course or any other extraordinary corporate event. The adjustment by the Administrator shall be final, binding and conclusive. No fractional shares of Stock shall be issued under the Plan resulting from any such adjustment, but the Administrator in its discretion may make a cash payment in lieu of fractional shares.

(d) Mergers and Other Transactions. In the case of and subject to the consummation of a Sale Event, the parties thereto may cause the assumption or continuation of Awards theretofore granted by the successor entity, or the substitution of such Awards with new Awards of the successor entity or parent thereof, with appropriate adjustment as to the number and kind of shares and, if appropriate, the per share exercise prices, as such parties shall agree (after taking into account any acceleration under any Award Certificate). Except as the Administrator may otherwise specify with respect to particular Awards in the relevant Award Certificate, to the extent the parties to such Sale Event do not provide for the assumption, continuation or substitution of Awards, upon the effective time of the Sale Event, the Plan and all outstanding Awards granted hereunder shall terminate. In the event of such termination, (i) the Company shall have the option (in its sole discretion) to make or provide for a payment, in cash or in kind, to the grantees holding Options and Stock Appreciation Rights, in exchange for the cancellation thereof, in an amount equal to the difference between (A) the Sale Price multiplied by the number of shares of Stock subject to outstanding Options and Stock Appreciation Rights (to the extent then exercisable at prices not in excess of the Sale Price) and (B) the aggregate exercise price of all such outstanding Options and Stock Appreciation Rights (provided that, in the case of an Option or Stock Appreciation Right with an exercise price equal to or less than the Sale Price, such Option or Stock Appreciation Right shall be cancelled for no consideration); or (ii) each grantee shall be permitted, within a specified period of time prior to the consummation of the Sale Event as determined by the Administrator, to exercise all outstanding Options and Stock Appreciation Rights (to the extent then exercisable) held by such grantee. The Company shall also have the option (in its sole discretion) to make or provide for a payment, in cash or in kind, to the grantees holding other Awards in an amount equal to the Sale Price multiplied by the number of vested shares of Stock under such Awards.

SECTION 4. ELIGIBILITY

Grantees under the Plan will be such full or part-time officers and other employees, Non-Employee Directors and Consultants of the Company and its Subsidiaries as are selected from time to time by the Administrator in its sole discretion.

SECTION 5. STOCK OPTIONS

(a) Award of Stock Options. The Administrator may grant Stock Options under the Plan. Any Stock Option granted under the Plan shall be in such form as the Administrator may from time to time approve.

Stock Options granted under the Plan may be either Incentive Stock Options or Non-Qualified Stock Options. Incentive Stock Options may be granted only to employees of the Company or any Subsidiary that is a "subsidiary corporation" within the meaning of Section 424(f) of the Code. To the extent that any Option does not qualify as an Incentive Stock Option, it shall be deemed a Non-Qualified Stock Option.

Stock Options granted pursuant to this Section 5 shall be subject to the following terms and conditions and shall contain such additional terms and conditions, not inconsistent with the terms of the Plan, as the Administrator shall deem desirable. If the Administrator so determines, Stock Options may be granted in lieu of cash compensation at the optionee's election, subject to such terms and conditions as the Administrator may establish.

(b) Exercise Price. The exercise price per share for the Stock covered by a Stock Option granted pursuant to this Section 5 shall be determined by the Administrator at the time of grant but shall not be less than 100 percent of the Fair Market Value on the date of grant. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the option price of such Incentive Stock Option shall be not less than 110 percent of the Fair Market Value on the grant date. Notwithstanding the foregoing, Stock Options may be granted with an exercise price per share that is less than 100 percent of the Fair Market Value on the date of grant pursuant to a transaction described in, and in a manner consistent with, Section 424(a) of the Code.

(c) Option Term. The term of each Stock Option shall be fixed by the Administrator, but no Stock Option shall be exercisable more than ten years after the date the Stock Option is granted. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the term of such Stock Option shall be no more than five years from the date of grant.

(d) Exercisability; Rights of a Stockholder. Stock Options shall become exercisable at such time or times, whether or not in installments, as shall be determined by the Administrator at or after the grant date. Subject to Section 2(b)(v), the Administrator may at any time accelerate the exercisability of all or any portion of any Stock Option. An optionee shall have the rights of a stockholder only as to shares acquired upon the exercise of a Stock Option and not as to unexercised Stock Options.

(e) Method of Exercise. Stock Options may be exercised in whole or in part, by giving written or electronic notice of exercise to the Company, specifying the number of shares to be purchased. Payment of the purchase price may be made by one or more of the following methods except to the extent otherwise provided in the Option Award Certificate:

(i) In cash, by certified or bank check or other instrument acceptable to the Administrator;

(ii) Through the delivery (or attestation to the ownership following such procedures as the Company may prescribe) of shares of Stock that are not then subject to restrictions under any Company plan. Such surrendered shares shall be valued at Fair Market Value on the exercise date;

(iii) By the optionee delivering to the Company a properly executed exercise notice together with irrevocable instructions to a broker to promptly deliver to the Company cash or a check payable and acceptable to the Company for the purchase price; provided that in the event the optionee chooses to pay the purchase price as so provided, the optionee and the broker shall comply with such procedures and enter into such agreements of indemnity and other agreements as the Company shall prescribe as a condition of such payment procedure; or

(iv) With respect to Stock Options that are not Incentive Stock Options, by a “net exercise” arrangement pursuant to which the Company will reduce the number of shares of Stock issuable upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price.

Payment instruments will be received subject to collection. The transfer to the optionee on the records of the Company or of the transfer agent of the shares of Stock to be purchased pursuant to the exercise of a Stock Option will be contingent upon receipt from the optionee (or a purchaser acting in his stead in accordance with the provisions of the Stock Option) by the Company of the full purchase price for such shares and the fulfillment of any other requirements contained in the Option Award Certificate or applicable provisions of laws (including the satisfaction of any withholding taxes that the Company is obligated to withhold with respect to the optionee). In the event an optionee chooses to pay the purchase price by previously-owned shares of Stock through the attestation method, the number of shares of Stock transferred to the optionee upon the exercise of the Stock Option shall be net of the number of attested shares. In the event that the Company establishes, for itself or using the services of a third party, an automated system for the exercise of Stock Options, such as a system using an internet website or interactive voice response, then the paperless exercise of Stock Options may be permitted through the use of such an automated system.

(f) Annual Limit on Incentive Stock Options. To the extent required for “incentive stock option” treatment under Section 422 of the Code, the aggregate Fair Market Value (determined as of the time of grant) of the shares of Stock with respect to which Incentive Stock Options granted under this Plan and any other plan of the Company or its parent and subsidiary corporations become exercisable for the first time by an optionee during any calendar year shall not exceed \$100,000. To the extent that any Stock Option exceeds this limit, it shall constitute a Non-Qualified Stock Option.

SECTION 6. STOCK APPRECIATION RIGHTS

(a) Award of Stock Appreciation Rights. The Administrator may grant Stock Appreciation Rights under the Plan. A Stock Appreciation Right is an Award entitling the recipient to receive shares of Stock (or cash, to the extent explicitly provided for in the applicable Award Certificate) having a value equal to the excess of the Fair Market Value of a share of Stock on the date of exercise over the exercise price of the Stock Appreciation Right multiplied by the number of shares of Stock with respect to which the Stock Appreciation Right shall have been exercised.

(b) Exercise Price of Stock Appreciation Rights. The exercise price of a Stock Appreciation Right shall not be less than 100 percent of the Fair Market Value of the Stock on the date of grant.

(c) Grant and Exercise of Stock Appreciation Rights. Stock Appreciation Rights may be granted by the Administrator independently of any Stock Option granted pursuant to Section 5 of the Plan.

(d) Terms and Conditions of Stock Appreciation Rights. Stock Appreciation Rights shall be subject to such terms and conditions as shall be determined from time to time by the Administrator. The term of a Stock Appreciation Right may not exceed ten years. The terms and conditions of each such Award shall be determined by the Administrator, and such terms and conditions may differ among individual Awards and grantees.

SECTION 7. RESTRICTED STOCK AWARDS

(a) Nature of Restricted Stock Awards. The Administrator may grant Restricted Stock Awards under the Plan. A Restricted Stock Award is any Award of Restricted Shares subject to such restrictions and conditions as the Administrator may determine at the time of grant. Conditions may be based on continuing employment (or other Service Relationship) and/or achievement of pre-established performance goals and objectives. The terms and conditions of each such Award shall be determined by the Administrator, and such terms and conditions may differ among individual Awards and grantees.

(b) Rights as a Stockholder. Upon the grant of the Restricted Stock Award and payment of any applicable purchase price, a grantee shall have the rights of a stockholder with respect to the voting of the Restricted Shares. Dividends with shall accrue, but not be paid, on Restricted Stock Awards subject to either a time-based restriction or performance-based goals until the applicable vesting provisions lapse. Unless the Administrator shall otherwise determine, (i) uncertificated Restricted Shares shall be accompanied by a notation on the records of the Company or the transfer agent to the effect that they are subject to forfeiture until such Restricted Shares are vested as provided in Section 7(d) below, and (ii) certificated Restricted Shares shall remain in the possession of the Company until such Restricted Shares are vested as provided in Section 7(d) below, and the grantee shall be required, as a condition of the grant, to deliver to the Company such instruments of transfer as the Administrator may prescribe.

(c) Restrictions. Restricted Shares may not be sold, assigned, transferred, pledged or otherwise encumbered or disposed of except as specifically provided herein or in the Restricted Stock Award Certificate. Except as may otherwise be provided by the Administrator either in the Award Certificate or, subject to Section 18 below, in writing after the Award is issued, if a grantee's employment (or other Service Relationship) with the Company and its Subsidiaries terminates for any reason, any Restricted Shares that have not vested at the time of termination shall automatically and without any requirement of notice to such grantee from or other action by or on behalf of, the Company be deemed to have been reacquired by the Company at its original purchase price (if any) from such grantee or such grantee's legal representative simultaneously with such termination of employment (or other Service Relationship), and thereafter shall cease to represent any ownership of the Company by the grantee or rights of the grantee as a stockholder. Following such deemed reacquisition of Restricted Shares that are represented by physical certificates, a grantee shall surrender such certificates to the Company upon request without consideration.

(d) Vesting of Restricted Shares. The Administrator at the time of grant shall specify the date or dates and/or the attainment of pre-established performance goals, objectives and other conditions on which the non-transferability of the Restricted Shares and the Company's right of repurchase or forfeiture shall lapse. Notwithstanding the foregoing, in the event that any such Restricted Shares granted to employees shall have a performance-based goal, the restriction period with respect to such shares shall not be less than one year, and in the event any such Restricted Shares granted to employees shall have a time-based restriction, the total restriction period with respect to such shares shall not be less than three years; provided, however, that Restricted Shares with a time-based restriction may become vested incrementally over such three-year period. Subsequent to such date or dates and/or the attainment of such pre-established performance goals, objectives and other conditions, the shares on which all restrictions have lapsed shall no longer be Restricted Shares and shall be deemed "vested."

SECTION 8. RESTRICTED STOCK UNITS

(a) Nature of Restricted Stock Units. The Administrator may grant Restricted Stock Units under the Plan. A Restricted Stock Unit is an Award of stock units that may be settled in shares of Stock (or cash, to the extent explicitly provided for in the Award Certificate) upon the satisfaction of such restrictions and conditions at the time of grant. Conditions may be based on continuing employment (or other Service Relationship) and/or achievement of pre-established performance goals and objectives. The terms and conditions of each such Award shall be determined by the Administrator, and such terms and conditions may differ among individual Awards and grantees. Notwithstanding the foregoing, in the event that any such Restricted Stock Units granted to employees shall have a performance-based goal, the restriction period with respect to such Award shall not be less than one year, and in the event any such Restricted Stock Units granted to employees shall have a time-based restriction, the total restriction period with respect to such Award shall not be less than three years; provided, however, that any Restricted Stock Units with a time-based restriction may become vested incrementally over such three-year period. Except in the case of Restricted Stock Units with a deferred settlement date that complies with Section 409A, at the end of the vesting period, the Restricted Stock Units, to the extent vested, shall be settled in the form of shares of Stock. Restricted Stock Units with deferred settlement dates are subject to Section 409A and shall contain such additional terms and conditions as the Administrator shall determine in its sole discretion in order to comply with the requirements of Section 409A.

(b) Election to Receive Restricted Stock Units in Lieu of Compensation. The Administrator may, in its sole discretion, permit a grantee to elect to receive a portion of future cash compensation otherwise due to such grantee in the form of an award of Restricted Stock Units. Any such election shall be made in writing and shall be delivered to the Company no later than the date specified by the Administrator and in accordance with Section 409A and such other rules and procedures established by the Administrator. Any such future cash compensation that the grantee elects to defer shall be converted to a fixed number of Restricted Stock Units based on the Fair Market Value of Stock on the date the compensation would otherwise have been paid to the grantee if such payment had not been deferred as provided herein. The Administrator shall have the sole right to determine whether and under what circumstances to permit such elections and to impose such limitations and other terms and conditions thereon as the Administrator deems appropriate. Any Restricted Stock Units that are elected to be received in lieu of cash compensation shall be fully vested, unless otherwise provided in the Award Certificate.

(c) Rights as a Stockholder. A grantee shall have the rights as a stockholder only as to shares of Stock acquired by the grantee upon settlement of Restricted Stock Units; provided, however, that the grantee may be credited with Dividend Equivalent Rights with respect to the stock units underlying his Restricted Stock Units, subject to the provisions of Section 11 and such terms and conditions as the Administrator may determine.

(d) Termination. Except as may otherwise be provided by the Administrator either in the Award Certificate or, subject to Section 18 below, in writing after the Award is issued, a grantee's right in all Restricted Stock Units that have not vested shall automatically terminate upon the grantee's termination of employment (or cessation of Service Relationship) with the Company and its Subsidiaries for any reason.

SECTION 9. UNRESTRICTED STOCK AWARDS

Grant or Sale of Unrestricted Stock. The Administrator may grant (or sell at par value or such higher purchase price determined by the Administrator) an Unrestricted Stock Award under the Plan. An Unrestricted Stock Award is an Award pursuant to which the grantee may receive shares of Stock free of any restrictions under the Plan. Unrestricted Stock Awards may be granted in respect of past services or other valid consideration, or in lieu of cash compensation due to such grantee.

SECTION 10. CASH-BASED AWARDS

Grant of Cash-Based Awards. The Administrator may grant Cash-Based Awards under the Plan. A Cash-Based Award is an Award that entitles the grantee to a payment in cash upon the attainment of specified performance goals. The Administrator shall determine the maximum duration of the Cash-Based Award, the amount of cash to which the Cash-Based Award pertains, the conditions upon which the Cash-Based Award shall become vested or payable, and such other provisions as the Administrator shall determine. Each Cash-Based Award shall specify a cash-denominated payment amount, formula or payment ranges as determined by the Administrator. Payment, if any, with respect to a Cash-Based Award shall be made in accordance with the terms of the Award and may be made in cash.

SECTION 11. DIVIDEND EQUIVALENT RIGHTS

(a) Dividend Equivalent Rights. The Administrator may grant Dividend Equivalent Rights under the Plan. A Dividend Equivalent Right is an Award entitling the grantee to receive credits based on cash dividends that would have been paid on the shares of Stock specified in the Dividend Equivalent Right (or other Award to which it relates) if such shares had been issued to the grantee. A Dividend Equivalent Right may be granted hereunder to any grantee as a component of an award of Restricted Stock Units or as a freestanding award. The terms and conditions of Dividend Equivalent Rights shall be specified in the Award Certificate. Dividend equivalents credited to the holder of a Dividend Equivalent Right may be paid currently or may be deemed to be reinvested in additional shares of Stock, which may thereafter accrue additional equivalents. Any such reinvestment shall be at Fair Market Value on the date of reinvestment or

such other price as may then apply under a dividend reinvestment plan sponsored by the Company, if any. Dividend Equivalent Rights may be settled in cash or shares of Stock or a combination thereof, in a single installment or installments. A Dividend Equivalent Right granted as a component of a Restricted Stock Unit Award shall provide that such Dividend Equivalent Right shall be settled only upon settlement or payment of, or lapse of restrictions on, such other Award, and that such Dividend Equivalent Right shall expire or be forfeited or annulled under the same conditions as such other Award.

(b) Termination. Except as may otherwise be provided by the Administrator either in the Award Certificate or, subject to Section 18 below, in writing after the Award is issued, a grantee's rights in all Dividend Equivalent Rights shall automatically terminate upon the grantee's termination of employment (or cessation of Service Relationship) with the Company and its Subsidiaries for any reason.

SECTION 12. TRANSFERABILITY OF AWARDS

(a) Transferability. Except as provided in Section 12(b) below, during a grantee's lifetime, his or her Awards shall be exercisable only by the grantee, or by the grantee's legal representative or guardian in the event of the grantee's incapacity. No Awards shall be sold, assigned, transferred or otherwise encumbered or disposed of by a grantee other than by will or by the laws of descent and distribution or pursuant to a domestic relations order. No Awards shall be subject, in whole or in part, to attachment, execution, or levy of any kind, and any purported transfer in violation hereof shall be null and void.

(b) Administrator Action. Notwithstanding Section 12(a), the Administrator, in its discretion, may provide either in the Award Certificate regarding a given Award or by subsequent written approval that the grantee (who is an employee or director) may transfer his or her Non-Qualified Stock Options to his or her immediate family members, to trusts for the benefit of such family members, or to partnerships in which such family members are the only partners, provided that the transferee agrees in writing with the Company to be bound by all of the terms and conditions of this Plan and the applicable Award. In no event may an Award be transferred by a grantee for value.

(c) Family Member. For purposes of Section 12(b), "family member" shall mean a grantee's child, stepchild, grandchild, parent, stepparent, grandparent, spouse, former spouse, sibling, niece, nephew, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, any person sharing the grantee's household (other than a tenant of the grantee), a trust in which these persons (or the grantee) have more than 50 percent of the beneficial interest, a foundation in which these persons (or the grantee) control the management of assets, and any other entity in which these persons (or the grantee) own more than 50 percent of the voting interests.

(d) Designation of Beneficiary. To the extent permitted by the Company, each grantee to whom an Award has been made under the Plan may designate a beneficiary or beneficiaries to exercise any Award or receive any payment under any Award payable on or after the grantee's death. Any such designation shall be on a form provided for that purpose by the Administrator and shall not be effective until received by the Administrator. If no beneficiary has been designated by a deceased grantee, or if the designated beneficiaries have predeceased the grantee, the beneficiary shall be the grantee's estate.

SECTION 13. TAX WITHHOLDING

(a) Payment by Grantee. Each grantee shall, no later than the date as of which the value of an Award or of any Stock or other amounts received thereunder first becomes includable in the gross income of the grantee for Federal income tax purposes, pay to the Company, or make arrangements satisfactory to the Administrator regarding payment of, any Federal, state, or local taxes of any kind required by law to be withheld by the Company with respect to such income. The Company and its Subsidiaries shall, to the extent permitted by law, have the right to deduct any such taxes from any payment of any kind otherwise due to the grantee. The Company's obligation to deliver evidence of book entry (or stock certificates) to any grantee is subject to and conditioned on tax withholding obligations being satisfied by the grantee.

(b) Payment in Stock. Subject to approval by the Administrator, a grantee may elect to have the Company's required tax withholding obligation satisfied, in whole or in part, by authorizing the Company to withhold from shares of Stock to be issued pursuant to any Award a number of shares with an aggregate Fair Market Value (as of the date the withholding is effected) that would satisfy the withholding amount due; provided, however, that the amount withheld does not exceed the maximum statutory tax rate or such lesser amount as is necessary to avoid liability accounting treatment. The Administrator may also require Awards to be subject to mandatory share withholding up to the required withholding amount. For purposes of share withholding, the Fair Market Value of withheld shares shall be determined in the same manner as the value of Stock includible in income of the Participants. The required tax withholding obligation may also be satisfied, in whole or in part, by an arrangement whereby a certain number of shares of Stock issued pursuant to any Award are immediately sold and proceeds from such sale are remitted to the Company in an amount that would satisfy the withholding amount due.

SECTION 14. SECTION 409A AWARDS

To the extent that any Award is determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A (a "409A Award"), the Award shall be subject to such additional rules and requirements as specified by the Administrator from time to time in order to comply with Section 409A. In this regard, if any amount under a 409A Award is payable upon a "separation from service" (within the meaning of Section 409A) to a grantee who is then considered a "specified employee" (within the meaning of Section 409A), then no such payment shall be made prior to the date that is the earlier of (i) six months and one day after the grantee's separation from service, or (ii) the grantee's death, but only to the extent such delay is necessary to prevent such payment from being subject to interest, penalties and/or additional tax imposed pursuant to Section 409A. Further, the settlement of any 409A Award may not be accelerated except to the extent permitted by Section 409A.

SECTION 15. TERMINATION OF EMPLOYMENT, TRANSFER, LEAVE OF ABSENCE, ETC.

- (a) Termination of Employment. If the grantee's Service Relationship is with a Subsidiary and such Subsidiary ceases to be a Subsidiary, the grantee shall be deemed to have terminated his or her Service Relationship for purposes of the Plan.
- (b) For purposes of the Plan, the following events shall not be deemed a termination of employment:
- (i) a transfer to the employment or service of the Company from a Subsidiary or from the Company to a Subsidiary, or from one Subsidiary to another; or
 - (ii) an approved leave of absence for military service or sickness, or for any other purpose approved by the Company, if the employee's right to re-employment is guaranteed either by a statute or by contract or under the policy pursuant to which the leave of absence was granted or if the Administrator otherwise so provides in writing.

SECTION 16. AMENDMENTS AND TERMINATION

The Board may, at any time, amend or discontinue the Plan and the Administrator may, at any time, amend or cancel any outstanding Award for the purpose of satisfying changes in law or for any other lawful purpose, but no such action shall adversely affect rights under any outstanding Award without the holder's consent. Except as provided in Section 3(c) or 3(d), without prior stockholder approval, in no event may the Administrator exercise its discretion to reduce the exercise price of outstanding Stock Options or Stock Appreciation Rights or effect repricing through cancellation and re-grants or cancellation of Stock Options or Stock Appreciation Rights in exchange for cash or other Awards. To the extent required under the rules of any securities exchange or market system on which the Stock is listed, to the extent determined by the Administrator to be required by the Code to ensure that Incentive Stock Options granted under the Plan are qualified under Section 422 of the Code, Plan amendments shall be subject to approval by the Company stockholders entitled to vote at a meeting of stockholders. Nothing in this Section 16 shall limit the Administrator's authority to take any action permitted pursuant to Section 3(c) or 3(d).

SECTION 17. STATUS OF PLAN

With respect to the portion of any Award that has not been exercised and any payments in cash, Stock or other consideration not received by a grantee, a grantee shall have no rights greater than those of a general creditor of the Company unless the Administrator shall otherwise expressly determine in connection with any Award or Awards. In its sole discretion, the Administrator may authorize the creation of trusts or other arrangements to meet the Company's obligations to deliver Stock or make payments with respect to Awards hereunder, provided that the existence of such trusts or other arrangements is consistent with the foregoing sentence.

SECTION 18. GENERAL PROVISIONS

(a) No Distribution. The Administrator may require each person acquiring Stock pursuant to an Award to represent to and agree with the Company in writing that such person is acquiring the shares without a view to distribution thereof.

(b) Issuance of Stock. To the extent certificated, stock certificates to grantees under this Plan shall be deemed delivered for all purposes when the Company or a stock transfer agent of the Company shall have mailed such certificates in the United States mail, addressed to the grantee, at the grantee's last known address on file with the Company. Uncertificated Stock shall be deemed delivered for all purposes when the Company or a Stock transfer agent of the Company shall have given to the grantee by electronic mail (with proof of receipt) or by United States mail, addressed to the grantee, at the grantee's last known address on file with the Company, notice of issuance and recorded the issuance in its records (which may include electronic "book entry" records). Notwithstanding anything herein to the contrary, the Company shall not be required to issue or deliver any evidence of book entry or certificates evidencing shares of Stock pursuant to the exercise or settlement of any Award, unless and until the Administrator has determined, with advice of counsel (to the extent the Administrator deems such advice necessary or advisable), that the issuance and delivery is in compliance with all applicable laws, regulations of governmental authorities and, if applicable, the requirements of any exchange on which the shares of Stock are listed, quoted or traded. Any Stock issued pursuant to the Plan shall be subject to any stop-transfer orders and other restrictions as the Administrator deems necessary or advisable to comply with federal, state or foreign jurisdiction, securities or other laws, rules and quotation system on which the Stock is listed, quoted or traded. The Administrator may place legends on any Stock certificate or notations on any book entry to reference restrictions applicable to the Stock. In addition to the terms and conditions provided herein, the Administrator may require that an individual make such reasonable covenants, agreements, and representations as the Administrator, in its discretion, deems necessary or advisable in order to comply with any such laws, regulations, or requirements. The Administrator shall have the right to require any individual to comply with any timing or other restrictions with respect to the settlement or exercise of any Award, including a window-period limitation, as may be imposed in the discretion of the Administrator.

(c) Stockholder Rights. Until Stock is deemed delivered in accordance with Section 18(b), no right to vote or receive dividends or any other rights of a stockholder will exist with respect to shares of Stock to be issued in connection with an Award, notwithstanding the exercise of a Stock Option or any other action by the grantee with respect to an Award.

(d) Other Compensation Arrangements; No Employment Rights. Nothing contained in this Plan shall prevent the Board from adopting other or additional compensation arrangements, including trusts, and such arrangements may be either generally applicable or applicable only in specific cases. The adoption of this Plan and the grant of Awards do not confer upon any employee any right to continued employment with the Company or any Subsidiary.

(e) Trading Policy Restrictions. Option exercises and other Awards under the Plan shall be subject to the Company's insider trading policies and procedures, as in effect from time to time.

(f) Clawback Policy. Awards under the Plan shall be subject to the Company's clawback policy, as in effect from time to time.

SECTION 19. EFFECTIVE DATE OF PLAN

This Plan shall become effective upon stockholder approval in accordance with applicable state law, the Company's bylaws and articles of incorporation, and applicable stock exchange rules. No grants of Stock Options and other Awards may be made hereunder after the tenth anniversary of the Effective Date and no grants of Incentive Stock Options may be made hereunder after the tenth anniversary of the date the Plan is approved by the Board.

SECTION 20. GOVERNING LAW

This Plan and all Awards and actions taken thereunder shall be governed by, and construed in accordance with the laws of the Commonwealth of Massachusetts, applied without regard to conflict of law principles.

DATE APPROVED BY BOARD OF DIRECTORS: APRIL 3, 2018

DATE APPROVED BY STOCKHOLDERS: MAY 16, 2018

CERTIFICATION

I, Tony J. Hunt, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Repligen 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 2, 2018

/s/ T ONY J. H UNT

Tony J. Hunt
President and Chief Executive Officer
(Principal executive officer)

CERTIFICATION

I, Jon Snodgres, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Repligen 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 2, 2018

/s/ J ON S NODGRES

Jon Snodgres
Chief Financial Officer
(Principal financial officer)

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

In connection with the Quarterly Report of Repligen Corporation (the “Company”) on Form 10-Q for the period ending June 30, 2018 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), the undersigned officers of the Company hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to my knowledge, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 2, 2018

By: /s/ T ONY J. H UNT
Tony J. Hunt
Chief Executive Officer and President
(Principal executive officer)

Date: August 2, 2018

By: /s/ J ON S NODGRES
Jon Snodgres
Chief Financial Officer
(Principal financial officer)

* This certification shall not be deemed “filed” for purposes of Section 18 of the Securities Exchange Act of 1934, or otherwise subject to the liability of that section, nor shall it be deemed to be incorporated by reference into any filing under the Securities Act of 1933 or the Securities Exchange Act of 1934.