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 September 30, 2020

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	**04-2729386**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**
41 Seyon Street, Bldg. 1, Suite 100 Waltham, MA	**02453**
(Address of Principal Executive Offices)	**(Zip Code)**

(781) 250-0111
Registrant's Telephone Number, Including Area Code

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.01 per share	**RGEN**	**The Nasdaq Global Select Market**

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

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

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

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

Emerging growth company ☐

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

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

The number of shares outstanding of the registrant's common stock on November 2, 2020 was 52,619,271.

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PART I – FINANCIAL INFORMATION

ITEM 1. Financial Statements

REPLIGEN CORPORATION
CONSOLIDATED BALANCE SHEETS
(Unaudited, amounts in thousands, except share data)

	September 30, 2020	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	$ 553,302	$ 528,392
Restricted cash	—	9,015
Accounts receivable, net of allowances of $621 and $525 at September 30, 2020 and December 31, 2019, respectively	55,830	43,068
Royalties and other receivables	95	148
Unbilled receivables	—	456
Inventories, net	78,531	54,832
Prepaid expenses and other current assets	8,970	5,917
Total current assets	696,728	641,828
Property, plant and equipment, net	55,355	48,455
Intangible assets, net	215,385	212,552
Goodwill	482,043	468,413
Deferred tax assets	2,192	2,920
Operating lease right of use assets	24,201	25,707
Other assets	412	238
Total assets	$ 1,476,316	$ 1,400,113
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 14,483	$ 11,425
Operating lease liability	4,460	3,557
Accrued liabilities	32,041	33,331
Total current liabilities	50,984	48,313
Convertible senior notes, net	240,942	232,767
Deferred tax liabilities	29,435	29,944
Operating lease liability, long-term	26,378	26,995
Other liabilities, long-term	3,707	2,326
Total liabilities	351,446	340,345
Commitments and contingencies (Note 10)		
Stockholders' equity:		
Preferred stock, $0.01 par value, 5,000,000 shares authorized, no shares issued or outstanding	—	—
Common stock, $0.01 par value; 80,000,000 shares authorized; 52,606,700 shares at September 30, 2020 and 52,078,258 shares at December 31, 2019 issued and outstanding	526	521
Additional paid-in capital	1,087,996	1,068,431
Accumulated other comprehensive loss	(9,723)	(15,027)
Retained earnings	46,071	5,843
Total stockholders' equity	1,124,870	1,059,768
Total liabilities and stockholders' equity	$ 1,476,316	$ 1,400,113

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

REPLIGEN CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(Unaudited, amounts in thousands, except per share data)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Revenue:				
Products	$ 94,029	$ 69,419	$ 257,521	$ 200,701
Royalty and other revenue	31	26	91	70
Total revenue	94,060	69,445	257,612	200,771
Costs and operating expenses:				
Cost of product revenue	39,626	31,425	108,471	88,978
Research and development	4,422	5,427	13,460	14,278
Selling, general and administrative	29,051	24,629	83,277	67,326
Total costs and operating expenses	73,099	61,481	205,208	170,582
Income from operations	20,961	7,964	52,404	30,189
Other income (expenses):				
Investment income	82	1,898	1,699	3,616
Loss on extinguishment of debt	—	(5,650)	—	(5,650)
Interest expense	(3,052)	(2,857)	(9,032)	(6,326)
Other (expenses) income	(248)	316	(632)	(23)
Other expenses, net	(3,218)	(6,293)	(7,965)	(8,383)
Income before income taxes	17,743	1,671	44,439	21,806
Income tax provision	3,191	12	4,211	3,999
Net income	$ 14,552	$ 1,659	$ 40,228	$ 17,807
Earnings per share:				
Basic	$ 0.28	$ 0.03	$ 0.77	$ 0.38
Diluted	$ 0.27	$ 0.03	$ 0.75	$ 0.37
Weighted average common shares outstanding:				
Basic	52,545	50,852	52,341	47,087
Diluted	53,469	51,809	53,300	47,930
Net income	$ 14,552	$ 1,659	$ 40,228	$ 17,807
Other comprehensive income (loss):				
Foreign currency translation adjustment	4,390	(6,741)	5,304	(9,901)
Comprehensive income (loss)	$ 18,942	$ (5,082)	$ 45,532	$ 7,906

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

REPLIGEN CORPORATION
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Unaudited, amounts in thousands, except share data)

	Nine Months Ended September 30, 2020					
	Common Stock					
	Number of Shares	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
Balance at December 31, 2019	52,078,258	$ 521	$1,068,431	$ (15,027)	$ 5,843	$ 1,059,768
Net income	—	—	—	—	40,228	40,228
Exercise of stock options and vesting of stock units	528,442	5	7,073	—	—	7,078
Stock-based compensation expense	—	—	12,492	—	—	12,492
Translation adjustment	—	—	—	5,304	—	5,304
Balance as of September 30, 2020	52,606,700	$ 526	$1,087,996	$ (9,723)	$46,071	$ 1,124,870

	Three Months Ended September 30, 2020					
	Common Stock					
	Number of Shares	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
Balance at June 30, 2020	52,494,884	$ 525	$1,082,096	$ (14,113)	$31,519	$ 1,100,027
Net income	—	—	—	—	14,552	14,552
Exercise of stock options and vesting of stock units	111,816	1	1,675	—	—	1,676
Stock-based compensation expense	—	—	4,225	—	—	4,225
Translation adjustment	—	—	—	4,390	—	4,390
Balance as of September 30, 2020	52,606,700	$ 526	$1,087,996	$ (9,723)	$46,071	$ 1,124,870

	Nine Months Ended September 30, 2019					
	Common Stock					
	Number of Shares	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Retained Earnings/ (Accumulated Deficit)	Total Stockholders' Equity
Balance at December 31, 2018	43,917,378	$ 439	$ 642,590	$ (11,893)	$ (15,568)	$ 615,568
Net income	—	—	—	—	17,807	17,807
Issuance of common stock for debt conversion	2,316,229	23	198,734	—	—	198,757
Reduction for equity component from debt conversion, net of tax	—	—	(200,079)	—	—	(200,079)
Exercise of stock options and vesting of stock units	311,299	3	1,055	—	—	1,058
Issuance of common stock pursuant to the acquisition of C Technologies, Inc.	779,221	8	53,930	—	—	53,938
Tax withholding on vesting of restricted stock units	(3,077)	—	(290)	—	—	(290)
Equity component of 0.375% senior convertible notes, net of tax	—	—	38,088	—	—	38,088
Proceeds from issuance of common stock, net of issuance cost of $18,607	4,731,531	48	320,665	—	—	320,713
Stock-based compensation expense	—	—	9,459	—	—	9,459
Translation adjustment	—	—	—	(9,901)	—	(9,901)
Balance as of September 30, 2019	52,052,581	$ 521	$1,064,152	$ (21,794)	$ 2,239	$ 1,045,118

	Three Months Ended September 30, 2019					
	Common Stock					
	Number of Shares	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
Balance at June 30, 2019	48,086,422	$ 481	$ 892,960	$ (15,053)	$ 580	$ 878,968
Net income	—	—	—	—	1,659	1,659
Issuance of common stock for debt conversion	2,316,200	23	198,732	—	—	198,755
Reduction of equity component from debt conversion, net of tax	—	—	(200,079)	—	—	(200,079)
Exercise of stock options and vesting of stock units	66,036	1	493	—	—	494
Tax withholding on vesting of restricted stock units	(3,077)	—	(290)	—	—	(290)
Equity component of 0.375% senior convertible notes, net of tax	—	—	38,088	—	—	38,088
Proceeds from issuance of common stock, net of issuance cost of $6,981	1,587,000	16	131,073	—	—	131,089
Stock-based compensation expense	—	—	3,175	—	—	3,175
Translation adjustment	—	—	—	(6,741)	—	(6,741)
Balance as of September 30, 2019	52,052,581	$ 521	$1,064,152	$ (21,794)	$ 2,239	$ 1,045,118

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

REPLIGEN CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited, amounts in thousands)

	Nine Months Ended September 30,	
	2020	**2019**
Cash flows from operating activities:		
Net income	$ 40,228	$ 17,807
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	19,581	14,791
Non-cash interest expense	8,175	4,863
Stock-based compensation expense	12,492	9,459
Deferred income taxes, net	72	(9,680)
Loss on extinguishment of debt	—	5,650
Other	228	114
Changes in operating assets and liabilities, excluding impact of acquisitions:		
Accounts receivable	(11,515)	(6,734)
Royalties and other receivables	157	26
Unbilled receivables	456	2,047
Inventories	(22,767)	(4,891)
Prepaid expenses and other assets	(2,908)	(1,075)
Operating lease right of use assets	2,574	787
Other assets	(260)	(66)
Accounts payable	3,317	(780)
Accrued expenses	(2,712)	7,263
Operating lease liability	(831)	(607)
Long-term liabilities	1,467	10,568
Total cash provided by operating activities	47,754	49,542
Cash flows from investing activities:		
Acquisitions, net of cash acquired	(28,445)	(182,154)
Additions to capitalized software costs	(3,585)	(4,630)
Purchases of property, plant and equipment	(11,067)	(11,413)
Total cash used in investing activities	(43,097)	(198,197)
Cash flows from financing activities:		
Proceeds from exercise of stock options	7,088	1,058
Payment of tax withholding obligation on vesting of restricted stock	(10)	(290)
Proceeds from issuance of convertible debt, net	—	278,555
Proceeds from issuance of common stock, net	—	320,713
Repayment of senior convertible notes	—	(114,989)
Total cash provided by financing activities	7,078	485,047
Effect of exchange rate changes on cash, cash equivalents and restricted cash	4,160	(7,785)
Net increase in cash, cash equivalents and restricted cash	15,895	328,607
Cash, cash equivalents and restricted cash, beginning of period	537,407	193,822
Cash, cash equivalents and restricted cash, end of period	$553,302	$ 522,429
Supplemental disclosure of non-cash investing and financing activities:		
Assets acquired under operating leases	$ 1,456	$ —
Fair value of 2,316,229 shares of common stock issued for conversion of convertible notes	$ —	$ 198,757
Fair value of common stock issued for acquisition of C Technologies, Inc.	$ —	$ 53,938

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

REPLIGEN CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

1. Summary of Significant Accounting Policies

Basis of Presentation

The 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 ("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 GAAP. These 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 ("Form 10-K") for the fiscal year ended December 31, 2019.

The preparation of financial statements in conformity with 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 consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries, Repligen Sweden AB, Repligen GmbH, Spectrum LifeSciences, LLC and its subsidiaries ("Spectrum"), C Technologies, Inc. ("C Technologies"), Engineered Molding Technology ("EMT") and Repligen Singapore Pte. Ltd. All significant intercompany accounts and transactions have been eliminated in consolidation.

The Company made no material changes in the application of its significant accounting policies that were disclosed in its Form 10-K. In the opinion of management, the accompanying unaudited 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.

Risks and Uncertainties

The ultimate impact that the current pandemic of the novel coronavirus ("COVID-19"), may have on the Company and its customers, employees, suppliers, vendors, business partners and distribution channels is currently unknown. The Company is closely monitoring the impact of this evolving situation on all aspects of its business. While COVID-19 did not materially affect the Company's financial results and business operations in the Company's three and nine months ended September 30, 2020, the Company is unable to predict the impact that COVID-19 may have on its financial position and operations moving forward due to numerous uncertainties. These estimates may change as new events occur and additional information is obtained, and actual results could differ materially from these estimates under different assumptions or conditions. The Company will continue to assess the evolving impact of COVID-19 and will make adjustments to its operations as necessary.

Recent Accounting Standards Updates

We consider the applicability and impact of all Accounting Standards Updates on the Company's consolidated financial statements. Updates not listed below were assessed and determined to be either not applicable or are expected to have minimal impact on the Company's consolidated financial position or results of operations. Recently issued Accounting Standards Updates that we feel may be applicable to the Company are as follows:

Recently Issued Accounting Standard Updates – Adopted During the Period

In August 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update No. ("ASU") 2018-13, *"Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement."* ASU 2018-13 includes amendments that aim to improve the effectiveness of fair value measurement disclosures. The amendments in this guidance modify the disclosure requirements on fair value measurements based on the concepts in FASB Concepts Statement, *"Conceptual Framework for Financial Reporting - Chapter 8: Notes to Financial Statements , "* including the consideration of costs and benefits. The Company adopted ASU 2018-13 on January 1, 2020. The adoption did not have a material impact on the Company's consolidated financial statements as of and for the three and nine months ended September 30, 2020.

In August 2018, the FASB issued ASU 2018-15, *"Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract."* ASU 2018-15 aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The guidance also requires the entity to expense the capitalized implementation costs of a hosting arrangement that is a service contract over the term of the hosting arrangement, which includes reasonably certain renewals. The Company adopted ASU 2018-13 on January 1, 2020. The adoption did not have a material impact on the Company's consolidated financial statements as of and for the three and nine months ended September 30, 2020.

In June 2016, the FASB issued ASU 2016-13, " *Financial Instruments-Credit Losses (Topic 326)."* ASU 2016-13 significantly changes how entities will account for credit losses for most financial assets and certain other instruments that are not measured at fair value through net income. ASU 2016-13 replaces the existing incurred loss model with an expected credit loss model that requires entities to estimate an expected lifetime credit loss on most financial assets and certain other instruments, including short-term trade receivables and contract assets, and expands disclosure requirements for credit quality of financial assets. The Company adopted ASU 2016-13 on January 1, 2020. The Company assessed all potential impacts that the adoption of this guidance has on its consolidated financial statements. Based on the composition of the Company's investment portfolio, accounts receivable, current market conditions and historical credit loss activity, the adoption of ASU 2016-13 by the Company did not have a material impact on its consolidated financial position, results of operations or cash flows as of and for the three and nine months ended September 30, 2020. The Company continues to monitor processes and controls for indications of an adjustment for future economic conditions at quarterly and annual reporting periods. See Note 5, *"Credit Losses,"* below for more information on the Company's adoption of ASC 326.

In November 2018, the FASB issued ASU 2018-18, *"Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606."* ASU 2018-18 clarifies the interaction between Topic 808, *"Collaborative Arrangements,"* and Topic 606, *"Revenue from Contracts with Customers,"* by making targeted improvements to GAAP for collaborative arrangements and providing guidance on whether certain transactions between collaborative arrangement participants should be accounted for with revenue under Topic 606. This includes improving comparability in the presentation of revenue for certain transactions between collaborative arrangement participants by allowing presentation of the units of account in collaborative arrangements that are within the scope of Topic 606 together with revenue accounted for under Topic 606. The Company adopted ASU 2018-13 on January 1, 2020. The adoption did not have a material impact on the Company's consolidated financial statements as of and for the three and nine months ended September 30, 2020.

In December 2019, the FASB issued ASU 2019-12, " *Income Taxes (Topic 740) – Simplifying the Accounting for Income Taxes."* ASU 2019-12 simplifies the accounting for income taxes by removing certain exceptions to the general principles in Topic 740, including, but not limited to, the exception to the incremental approach for intraperiod tax allocation when there is a loss from continuing operations and income or a gain from other items, the exceptions related to the recognition of a deferred tax liability related to an equity method investment and the exception to methodology for calculating income taxes in an interim period when a year-to-date loss exceeds the anticipated loss for the year. The Company adopted ASU 2018-13 on January 1, 2020. The adoption did not have a material impact on the Company's consolidated financial statements as of and for the three and nine months ended September 30, 2020.

Recently Issued Accounting Standard Updates – Not Yet Adopted

In August 2020, the FASB issued ASU 2020-06, " *Debt - Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging - Contracts in Entity ' s Own Equity (Subtopic 815-40). "* ASU 2020-06 simplifies the accounting for convertible debt instruments and convertible preferred stock by reducing the number of accounting models and the number of embedded conversion features that could be recognized separately from the primary contract. ASU 2020-06 also enhances transparency and improves disclosures for convertible instruments and earnings per share guidance. ASU 2020-06 is effective for annual reporting periods beginning after December 15, 2021, including interim periods within those fiscal years. Early adoption is permitted, but no earlier than fiscal years beginning after December 15, 2020. This update permits the use of either the modified retrospective or fully retrospective method of transition. The Company is currently evaluating the timing and impact of the adoption of ASU 2020-06 on the Company's consolidated financial statements.

2. Fair Value Measurements

The Company uses various valuation approaches in determining the fair value of its assets and liabilities. 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.

As of September 30, 2020 and December 31, 2019, cash and cash equivalents on the Company's consolidated balance sheets included $395.6 million and $415.6 million, respectively, in a money market account. These funds are valued on a recurring basis using Level 1 inputs.

In July 2019, the Company issued $287.5 million aggregate principal amount of the Company's 0.375% Convertible Senior Notes due July 15, 2024 (the "2019 Notes"). Interest is payable semi-annually in arrears on January 15 and July 15 of each year. The 2019 Notes will mature on July 15, 2024 , unless earlier converted or repurchased in accordance with their terms. As of September 30, 2020, the carrying value of the 2019 Notes was $240.9 million, net of unamortized discount, and the fair value of the 2019 Notes was $416.0 million. The fair value of the 2019 Notes is a Level 1 valuation and was determined based on the most recent trade activity of the 2019 Notes as of September 30, 2020. The 2019 Notes are discussed in more detail in Note 8, *"Convertible Senior Notes"* to these consolidated financial statements.

The Company's non-financial assets include goodwill and other intangible assets, which we classify as Level 3 items. These assets are measured at fair value on a non-recurring basis as part of our impairment testing. See Note 6, *"Goodwill and Intangible Assets,"* below for additional information related to goodwill and intangible assets, and our impairment testing.

During the three and nine months ended September 30, 2020, there were no remeasurements to fair value of financial assets and liabilities that are not measured at fair value on a recurring basis.

3. Acquisitions

Engineered Molding Technology LLC

On July 13, 2020, the Company completed the acquisition of 100% of the membership interests of Engineered Molding Technology LLC ("EMT"), a New York limited liability company , pursuant to a Membership Interest Purchase Agreement, dated June 26, 2020, by and among the Company, EMT, and Michael Pandori and Todd Etesse, the legal and beneficial owners of EMT (such acquisition, the "EMT Acquisition").

EMT, which is headquartered in Clifton Park, New York, is an innovator and manufacturer of single-use silicone assemblies and components used in the manufacturing of biologic drugs. EMT's standard and custom molding as well as their over-molded connectors and silicone tubing products are key components in single-use filtration and chromatography systems. EMT's products will complement and expand Repligen's single-use product offerings.

Consideration Transferred

The EMT Acquisition was accounted for as a purchase of a business under ASC 805, *"Business Combinations"*. Total consideration paid was $28.5 million , which included $2.2 million deposited into an escrow account against which the Company may make claim s for indemnification . Under the acquisition method of accounting, the net assets of EMT were recorded as of the acquisition date, at their respective fair values, and consolidated with those of Repligen. The fair value of the net tangible assets acquired is estimated to be approximately $1.5 million, the fair value of the intangible assets acquired is estimated to be $14.4 million, and the residual goodwill is estimated to be approximately $12.6 million. The estimated consideration and preliminary purchase price information has been prepared using a preliminary valuation. The preparation of the valuation required the use of significant assumptions and estimates . 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 Repligen believes to be reasonable. However, actual results may differ from these estimates.

Acquisition - 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 incurred $1.0 million and $1.1 million of acquisition related costs during the three and nine months ended September 30, 2020. The transaction costs are included in selling, general and administrative expenses in the consolidated statements of comprehensive income (loss).

Fair Value of Net Assets Acquired

The allocation of purchase price is based on the fair value of assets acquired and liabilities assumed as of the acquisition date, based on the preliminary valuation. As additional information becomes available, the Company may further revise its preliminary purchase price allocation during the remainder of the measurement period (which will not exceed 12 months from July 13, 2020). Any such revisions or changes may be material. The components and allocation of the purchase price consists of the following amounts (amounts in thousands):

Cash and cash equivalents	$ 69
Accounts receivable	1,057
Inventory	449
Prepaid expenses and other current assets	7
Fixed assets, net	472
Operating lease right of use assets	1,050
Customer relationships	11,080
Developed technology	2,910
Trademark and tradename	320
Non-compete agreements	50
Goodwill	12,573
Accounts payable	(283)
Accrued liabilities	(190)
Operating lease liability	(211)
Operating lease liability, long-term	(839)
Fair value of net assets acquired	**$28,514**

Acquired Goodwill

The goodwill of $12.6 million represents future economic benefits expected to arise from anticipated synergies from the integration of EMT. These synergies include certain cost savings, operating efficiencies and other strategic benefits projected to be achieved as a result of the EMT Acquisition. Substantially all of the goodwill recorded is expected to be deductible for income tax purposes.

Intangible Assets

The following table sets forth the components of the identified intangible assets associated with the EMT Acquisition and their estimated useful lives:

	Useful life	Fair Value (Amounts in thousands)
Customer relationships	14 years	$ 11,080
Developed technology	11 years	2,910
Trademark and tradename	14 years	320
Non-competition agreements	3 years	50
		$ 14,360

Revenue, Net Income and Pro Forma Presentation

The Company has included the operating results of EMT in its consolidated statements of comprehensive income (loss) since the July 13, 2020 acquisition date. The Company does not consider this acquisition to be material to its consolidated statements of comprehensive income (loss) and therefore has not included pro forma results.

C Technologies, Inc.

On May 31, 2019, Repligen acquired C Technologies, pursuant to the terms of a Stock Purchase Agreement (the "Agreement"), by and among Repligen, C Technologies and Craig Harrison, an individual and sole stockholder of C Technologies (such acquisition, the "C Technologies Acquisition").

Acquisition-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 incurred $4.0 million in transaction costs for the nine months ended September 30, 2019. The transaction costs are included in selling, general and administrative expenses in the consolidated statements of comprehensive income (loss). In connection with the transaction, an additional $9.0 million was paid to employees during the second quarter of 2020, based on their continued employment with the Company one year after the date of the close of the C Technologies Acquisition. The Company has recognized $3.7 million of compensation expense associated with this amount due to employees during the nine months ended September 30, 2020 and has recognized $9.0 million of compensation expense associated with this amount due since the C Technologies Acquisition.

Fair Value of Net Assets Acquired

The allocation of purchase price is based on the fair value of assets acquired and liabilities assumed as of the acquisition date, based on the preliminary valuation. The Company obtained this information during due diligence and through other sources. In the months after closing, the Company obtained additional information about these assets and liabilities as it learned more about C Technologies. The Company refined the estimates of fair value to more accurately allocate the purchase price. Only items identified as of the acquisition date were considered for subsequent adjustment. We made appropriate adjustments to the purchase price allocation during the measurement period, which was one year from the acquisition date. The components and allocation of the purchase price consists of the following amounts (amounts in thousands):

Cash and cash equivalents	$ 3,795
Restricted cash	26,933
Accounts receivable	3,044
Inventory	3,783
Prepaid expenses and other current assets	93
Fixed assets	40
Operating lease right of use asset	3,836
Customer relationships	59,680
Developed technology	28,920
Trademark and tradename	1,570
Non-competition agreements	660
Goodwill	142,314
Deferred taxes	895
Accounts payable	(436)
Accrued liabilities	(2,767)
Accrued bonus	(26,928)
Deferred revenue	(1,709)
Operating lease liability	(51)
Operating lease liability, long-term	(3,785)
Fair value of net assets acquired	**$239,887**

Acquired Goodwill

The goodwill of $142.3 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. Substantially all of the goodwill recorded is expected to be deductible for income tax purposes. Pursuant to the Company's business combination accounting policy included in Note 2, *" Summary of Significant Accounting Policies – Business Combinations, Goodwill and Intangible Assets, "* of the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019, the Company

recorded goodwill adjustments for the effects on goodwill of changes to net assets acquired during the period that such change is identified, provided that any such change is within the measurement period (up to one year from the date of the acquisition). In March 2020, the Company recorded an adjustment to goodwill of $0.3 million related to additional state income tax liabilities to be paid to the seller, which were incurred from the Company's finalized 338(h)(10) tax election.

Revenue, Net Income and Pro Forma Presentation

The Company recorded revenue from C Technologies of $9.0 million and $23.3 million for the three and nine months ended September 30, 2020, respectively, and $16.4 million from May 31, 2019, the date of acquisition, to December 31, 2019. The Company recorded a net income from C Technologies' results of operations of $2.1 million and a net loss of $0.8 million for the three and nine months ended September 30, 2020, respectively, and a net loss of $7.4 million from May 31, 2019 to December 31, 2019. The Company has included the operating results of C Technologies in its consolidated statements of comprehensive income (loss) since the May 31, 2019 acquisition date. The following pro forma financial information presents the combined results of operations of Repligen and C Technologies as if the acquisition had occurred on January 1, 2019 after giving effect to certain pro forma adjustments. The pro forma adjustments reflected herein include only those adjustments that are directly attributable to the C Technologies Acquisition, factually supportable and have a recurring impact. These pro forma adjustments include amortization expense on the acquired identifiable intangible assets, adjustments to stock-based compensation expense for equity compensation issued to C Technologies employees and the income tax effect of the adjustments made. In addition, acquisition-related transaction costs and an accounting adjustment to record inventory at fair value were excluded from pro forma net income in 2019.

Prior to the C Technologies Acquisition, C Technologies did not generate monthly or quarterly financial statements that were prepared in accordance with GAAP.

The following pro forma financial information does not reflect any adjustments for anticipated expense savings resulting from the acquisition and is not necessarily indicative of the operating results that would have actually occurred had the transaction been consummated on January 1, 2019 or of future results (amounts in thousands, except per share data):

	Nine Months Ended September 30, 2019
Pro forma total revenue	$ 209,960
Pro forma net income	$ 21,012
Pro forma earnings per share:	
Basic	$ 0.45
Diluted	$ 0.44

4. Revenue Recognition

The Company generates revenue from the sale of bioprocessing products, equipment devices, and related consumables used with these equipment devices to customers in the life science and biopharmaceutical industries. Under ASC 606, *"Revenue from Contracts with Customers,"* 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.

Disaggregation of Revenue

Revenues for the three and nine months ended September 30, 2020 and 2019 were as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
	(Amounts in thousands)			
Product revenue	$94,029	$69,419	$257,521	$200,701
Royalty and other income	31	26	91	70
Total revenue	$94,060	$69,445	$257,612	$200,771

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.

Disaggregated revenue from contracts with customers by geographic region can be found in Note 15, *"Segment Reporting,"* below.

Revenue from significant customers that represent 10% or more of the Company's total revenue is as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
	(Amounts in thousands)			
Cytiva (formerly GE Healthcare)	N/A	N/A	N/A	$23,759
MilliporeSigma	N/A	$ 9,458	$29,387	$28,354

Chromatography Products

The Company's chromatography products include 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. OPUS columns are designed to be disposable following a production campaign. Each OPUS column is delivered pre-packaged with the customer's choice of chromatography resin, which is either provided by the Company for the customer or customer supplied. 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.

Filtration Products

The Company's filtration products generate revenue through the sale of KrosFlo ® hollow fiber TFF systems, TangenX ® flat sheet cassettes, Spectrum ® hollow fiber filters, membranes and modules, XCell ATF ® systems and related consumables . Supporting our systems, we also sell ProConnex ® single-use flow path assemblies and custom silicone-based, single-use flow path assemblies and components from EMT .

The Company's KrosFlo systems are used in the filtration, isolation, purification and concentration of biologics and diagnostic products. 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. 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 TangenX flat sheet cassettes (SIUS ® , SIUS Gamma ® and PRO) are not highly interdependent on one another and are therefore considered distinct products that represent separate performance obligations. Product revenue from the sale of TangenX flat sheet cassettes are generally recognized at a point in time upon transfer of control of the customer.

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 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. XCell ATF systems typically include a filtration system and consumables (i.e., tubing sets, 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 tubing set(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 XCell ATF system and therefore represent a distinct performance obligation. XCell 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. XCell 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.

On July 13, 2020, the Company consummated the EMT Acquisition and added EMT's silicone-based, single-use components and manifolds to its filtration franchise. These products are key components in single-use filtration and chromatography systems and will help expand its line of single-use ProConnex flow paths, streamline its supply chain for ATF and provide more flexibility as the Company scales and expands its single-use and systems portfolios.

Process Analytics Products

The Process Analytics franchise generates revenue primarily through the sale of the SoloVPE and FlowVPE Slope Spectroscopy systems, consumables and service. These products complement and support the Company's existing Filtration, Chromatography and Proteins franchises as they allow end users to make in-line protein concentration measurements in filtration, chromatography and fill-finish applications, designed to allow for real-time process monitoring.

Protein Products

The Company's Protein franchise generates revenue through the sale of Protein A affinity 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 for 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.

Other Products

The Company's other products include operating room products sold to hospitals. 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 revenues from contracts with customers as of September 30, 2020 (amounts in thousands):

	2020
Balances from contracts with customers only:	
Accounts receivable	$55,830
Deferred revenue (included in accrued liabilities in the consolidated balance sheets)	$10,141
Revenue recognized during the nine-month period ended September 30, 2020 relating to:	
The beginning deferred revenue balance	$ 3,133
Changes in pricing related to products or services satisfied in previous periods	$ —

The timing of revenue recognition, billings and cash collections results in the accounts receivables and deferred revenue balances 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.

5. Credit Losses

Effective January 1, 2020, the Company adopted ASU 2016-13, *"Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments,"* prospectively. ASU 2016-13 replaces the incurred loss impairment model with an expected credit loss impairment model for financial instruments, including trade receivables. The guidance requires entities to consider forward-looking information to estimate expected credit losses, resulting in earlier recognition of losses for receivables that are current or not yet due. Upon adoption, changes in the allowance were not material for the transition period starting January 1, 2020 through the nine months ended September 30, 2020.

The Company is exposed to credit losses primarily through sales of products and services. The Company's expected loss allowance methodology for accounts receivable is developed using historical collection experience, current and future economic and market conditions and a review of the current status of customers' trade accounts receivables. Customers are pooled based on sharing specific risk factors, including geographic location. Due to the short-term nature of such receivables, the estimated accounts receivable that may not be collected is based on aging of the accounts receivable balances.

Customers are assessed for credit worthiness upfront through a credit review, which includes assessment based on the Company's analysis of their financial statements when a credit rating is not available. The Company evaluates contract terms and conditions, country and political risk, and may require prepayment to mitigate risk of loss. Specific allowance amounts are established to record the appropriate provision for customers that have a higher probability of default. The Company monitors changes to the receivables balance on a timely basis, and balances are written off as they are determined to be uncollectable after all collection efforts have been exhausted. Estimates of potential credit losses are used to determine the allowance. It is based on assessment of anticipated payment and all other historical, current and future information that is reasonably available.

The accounts receivable balance on the Company's consolidated balance sheet as of September 30, 2020 was $55.8 million, net of $0.6 million of allowances. The following table provides a roll-forward of the allowance for credit losses in 2020 that is deducted from the amortized cost basis of accounts receivable to present the net amount expected to be collected (amounts in thousands):

	2020
Balance at January 1, 2020	$(525)
Current period change for expected credit losses	(133)
Balance at March 31, 2020	(658)
Current period change for write-offs	37
Current period change for expected credit losses	83
Balance at June 30, 2020	(538)
Current period change for expected credit losses	(83)
Balance at September 30, 2020	$(621)

6. Goodwill and Intangible Assets

Goodwill

Goodwill represents the difference between the purchase price and the estimated fair value of identifiable assets acquired and liabilities assumed. Goodwill acquired in a business combination and determined to have an indefinite useful life is not amortized, but instead is tested for impairment at least annually in accordance with ASC 350, *"Intangibles – Goodwill and Other"* . The following table represents the change in the carrying value of goodwill for the nine months ended September 30, 2020 (amounts in thousands):

Balance as of December 31, 2019	$468,413
Acquisition of Engineered Molding Technology	12,573
Goodwill adjustment related to C Technologies, Inc.	293
Cumulative translation adjustment	764
Balance as of September 30, 2020	$482,043

During each of the fourth quarters of 2019, 2018 and 2017, the Company completed its annual impairment assessments and concluded that goodwill was not impaired in any of those years. The Company has not identified any "triggering" events which indicate an impairment of goodwill in the three and nine months ended September 30, 2020.

Intangible Assets

Intangible assets with a definitive life are amortized over their useful lives using the straight-line method, and the amortization expense is recorded within cost of product revenue and selling, general and administrative expenses in the Company's statements of comprehensive income (loss). 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 the Company's 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 September 30, 2020.

Indefinite-lived assets are reviewed for impairment at least annually. There has been no impairment of the Company's intangible assets for the periods presented.

Intangible assets, net consisted of the following at September 30, 2020:

	September 30, 2020			
	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Weighted Average Useful Life (in years)
	(Amounts in thousands)			
Finite-lived intangible assets:				
Technology - developed	$ 85,196	$ (13,054)	$ 72,142	18
Patents	240	(240)	—	8
Customer relationships	172,325	(33,861)	138,464	15
Trademarks	4,072	(480)	3,592	19
Other intangibles	1,750	(1,263)	487	3
Total finite-lived intangible assets	263,583	(48,898)	214,685	16
Indefinite-lived intangible asset:				
Trademarks	700	—	700	—
Total intangible assets	$264,283	$ (48,898)	$215,385	

Intangible assets consisted of the following at December 31, 2019:

	December 31, 2019			
	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Weighted Average Useful Life (in years)
	(Amounts in thousands)			
Finite-lived intangible assets:				
Technology - developed	$ 82,169	$ (9,669)	$ 72,500	19
Patents	240	(240)	—	8
Customer relationships	160,825	(25,642)	135,183	15
Trademarks	3,752	(333)	3,419	20
Other intangibles	1,697	(947)	750	3
Total finite-lived intangible assets	248,683	(36,831)	211,852	16
Indefinite-lived intangible asset:				
Trademarks	700	—	700	—
Total intangible assets	$249,383	$ (36,831)	$212,552	

Amortization expense for finite-lived intangible assets was $4.0 million and $3.9 million for the three months ended September 30, 2020 and 2019, respectively. Amortization expense was $11.8 million and $9.6 million for the nine months ended September 30, 2020 and 2019, respectively. As of September 30, 2020, the Company expects to record the following amortization expense in future periods (amounts in thousands):

For the Nine Months Ended September 30,	Estimated Amortization Expense
2020 (remaining three months)	$ 3,964
2021	15,855
2022	15,853
2023	15,749
2024	15,298
2025 and thereafter	147,966
Total	$ 214,685

7. Consolidated Balance Sheet Detail

Inventories, net

Inventories, net consists of the following:

	As of	
	September 30, 2020	December 31, 2019
	(Amounts in thousands)	
Raw materials	$ 42,201	$ 29,328
Work-in-process	6,192	8,360
Finished products	30,138	17,144
Total inventories, net	$ 78,531	$ 54,832

Property, Plant and Equipment

Property, plant and equipment consist of the following:

	As of	
	September 30, 2020	December 31, 2019
	(Amounts in thousands)	
Land	$ 1,023	$ 1,023
Buildings	989	764
Leasehold improvements	29,776	23,905
Equipment	39,094	36,257
Furniture, fixtures and office equipment	8,055	6,312
Computer hardware and software	14,468	8,810
Construction in progress	6,416	6,707
Other	348	56
Total property, plant and equipment	100,169	83,834
Less - Accumulated depreciation	(44,814)	(35,379)
Total property, plant and equipment, net	$ 55,355	$ 48,455

Depreciation expense totaled $2.8 million and $1.8 million for the three months ended September 30, 2020 and 2019, respectively. Depreciation expenses totaled $7.8 million and $5.2 million for the nine months ended September 30, 2020 and 2019, respectively.

Accrued Liabilities

Accrued liabilities consist of the following:

	As of	
	September 30, 2020	December 31, 2019
	(Amounts in thousands)	
Employee compensation	$ 14,652	$ 19,850
Taxes	2,759	3,874
Royalty and license fees	1,000	123
Warranties	737	1,500
Professional fees	1,745	1,081
Deferred revenue	10,141	5,005
Other	1,007	1,898
Total accrued liabilities	$ 32,041	$ 33,331

8. Convertible Senior Notes

0.375% Convertible Senior Notes due 2024

On July 19, 2019, the Company issued $287.5 million aggregate principal amount of 0.375% Convertible Senior Notes due 2024 (“2019 Notes”), which includes the underwriters’ exercise in full of an option to purchase an additional $37.5 million aggregate principal amount of 2019 Notes (the “Notes Offering”). The net proceeds of the Notes Offering, after deducting underwriting discounts and commissions and other related offering expenses payable by the Company, were approximately $278.5 million.

The 2019 Notes are senior, unsecured obligations of the Company, and bear interest at a rate of 0.375% per year. Interest is payable semi-annually in arrears on January 15 and July 15 of each year, beginning on January 15, 2020. The 2019 Notes will mature on July 15, 2024, unless earlier repurchased or converted in accordance with their terms. The initial conversion rate for the 2019 Notes is 8.6749 shares of the Company's common stock per $1,000 principal amount of 2019 Notes (which is equivalent to an initial conversion price of approximately $115.28 per share). Prior to the close of business on the business day immediately preceding April 15, 2024, the 2019 Notes will be convertible at the option of the holders of 2019 Notes only upon the satisfaction of specified conditions and during certain periods. Thereafter until the close of business on the second scheduled trading day immediately preceding the maturity date, the 2019 Notes will be convertible at the options of the holders of 2019 Notes at any time regardless of these conditions. Conversion of the 2019 Notes will be settled in cash, shares of the Company's common stock or a combination thereof, at the Company's election. The 2019 Notes are not redeemable by the Company prior to maturity.

Holders of 2019 Notes may require the Company to repurchase their 2019 Notes upon the occurrence of a fundamental change prior to maturity at a repurchase price equal to 100% of the principal amount thereof, plus accrued and unpaid interest to, but excluding, the date of repurchase. In connection with certain corporate events, the Company will, under certain circumstances, increase the conversion rate for holders of 2019 Notes who elect to convert their 2019 Notes in connection with such corporate events.

As of September 30, 2020, the conditions allowing holders of the 2019 Notes to convert have not been met and therefore the 2019 Notes are not yet convertible and are recorded as a long-term liability in the Company's consolidated balance sheet at September 30, 2020. No 2019 Notes were converted by the holders of such notes in the third quarter of 2020. In the event the closing price conditions are met in the fourth quarter of 2020 or a future fiscal quarter, the 2019 Notes will be convertible at a holder's option during the immediately following fiscal quarter.

The Company accounts for the 2019 Notes as separate liability and equity components. We determined the carrying amount of the liability component as the present value of its cash flows using a discount rate of 4.5% based on comparative convertible transactions for similar companies. The proceeds allocated to the debt conversion feature were $52.1 million. This amount was calculated by deducting the carrying value of the liability component from the principal amount of the 2019 Notes as a whole. The difference represents a debt discount that is amortized to interest expense on the Company's consolidated statement of comprehensive income (loss) over the term of the 2019 Notes using the effective interest rate method. The Company will assess 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.

The Company allocates transaction costs related to the issuance of the 2019 Notes to the liability and equity components using the same proportions as the initial carrying value of the 2019 Notes. Transaction costs related to the liability component were $7.4 million and are being amortized to interest expense using the effective interest method over the term of the 2019 Notes. Transaction costs attributable to the equity component were $1.6 million and are netted with the equity component of the 2019 Notes in stockholders' equity of the Company's consolidated balance sheet at September 30, 2020.

The net carrying value of the liability component of the 2019 Notes is as follows:

	As of	
	September 30, 2020	December 31, 2019
	(Amounts in thousands)	
0.375% convertible senior notes due 2024:		
Principal amount	$ 287,500	$ 287,500
Less: unamortized debt discount	(40,764)	(47,921)
Less: unamortized debt issuance costs	(5,794)	(6,812)
Total debt	240,942	232,767
Less: current portion	—	—
Net carrying amount	$ 240,942	$ 232,767

Interest expense recognized on the 2019 Notes for the three months ended September 30, 2020 was $0.3 million, $2.4 million and $0.3 million 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 2019 Notes for the nine months ended September 30, 2020 was $0.8 million, $7.2 million and $1.0 million 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 2019 Notes is 5.1%, which included the interest on the

2019 Notes, amortization of the debt discount and debt issuance costs. As of September 30, 2020, the carrying value of the 2019 Notes was $240.9 million and the fair value of the principal was $416.0 million. The fair value of the 2019 Notes was determined based on the most recent trade activity of the 2019 Notes as of September 30, 2020.

Conversion of the 2.125% Convertible Senior Notes due 2021

The Company utilized a portion of the proceeds from the issuance of the 2019 Notes to settle its outstanding 2.125% Convertible Senior Notes due 2021 (the "2016 Notes") during the third quarter of 2019. On July 16, 2019, the Company entered into separate privately negotiated agreements with certain holders of the 2016 Notes to exchange an aggregate of $92.0 million principal aggregate amount of the 2016 Notes for shares of the Company's common stock, together with cash, in private placement transactions (the "Note Exchanges"). On July 19, 2019 and July 22, 2019, the Company used approximately $92.3 million (including $0.3 million of accrued interest) and 1,850,155 shares of its common stock valued at $161.0 million to settle the Note Exchanges for total consideration of $253.3 million, of which $163.6 million was allocated to reacquiring the equity component of the 2016 Notes. The Company allocated the consideration transferred to the liability and equity components using the same proportions as the initial carrying value of the 2016 Notes. The transaction resulted in a loss on extinguishment of debt of $4.6 million in the Company's consolidated statements of comprehensive income (loss) for the three and nine months ended September 30, 2019.

On July 19, 2019, the Company issued a Notice of Redemption in respect of the 2016 Notes, which provided that, on September 23, 2019, the Company would redeem all 2016 Notes that had not been converted, repurchased or exchanged prior to such date at a redemption price in cash equal to 100% of the principal amount thereof plus accrued and unpaid interest. On September 23, 2019, the Company used $23.0 million and 466,045 shares of its common stock valued at $37.8 million to settle the remaining 2016 Notes for a total of $60.8 million, of which $38.3 million was allocated to reacquiring the equity component of the 2016 Notes. This transaction resulted in a loss on extinguishment of debt of $1.1 million recorded on the Company's consolidated statements of comprehensive income (loss). The total loss for the three and nine months ended September 30, 2019 of $5.7 million represents the difference between the fair value of the liability component of the 2016 Notes and its related carrying value immediately before the exchange.

The fair value of the liability component was calculated using a discounted cash flow technique with an effective interest rate of 3.9%, representing the estimated nonconvertible debt borrowing rate with a maturity as of the measurement date consistent with the 2016 Notes maturity date of June 1, 2021. In addition, in accordance with this guidance, a portion of the fair value of the consideration transferred is allocated to the reacquisition of the equity component, which is the difference between the fair value of the consideration transferred and the fair value of the liability component immediately before the exchange. As a result, on a gross basis, $200.1 million was allocated to the reacquisition of the equity component of the original instrument, which is recorded net of deferred taxes within additional paid-in capital on the Company's consolidated balance sheet.

The cash conversion feature of the 2016 Notes required bifurcation from the 2016 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 2016 Notes, which resulted in a fair value of the liability component of $96.3 million upon issuance, calculated as the present value of implied future payments based on the $115.0 million aggregate principal amount. The equity component of the 2016 Notes was recognized as a debt discount, recorded in additional paid-in capital, and represents the difference between the aggregate principal of the 2016 Notes and the fair value of the 2016 Notes without conversion option on their issuance date. The debt discount was amortized to interest expense using the effective interest method over five years, or the life of the 2016 Notes.

Interest expense recognized on the 2016 Notes for the three months ended September 30, 2019 was $0.1 million, $0.5 million and $0.1 million 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 2016 Notes for the nine months ended September 30, 2019 was $1.3 million, $2.4 million and $0.4 million 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 2016 Notes was 6.6%, which included the interest on the 2016 Notes, amortization of the debt discount and debt issuance costs.

9. Stockholders' Equity

Public Offerings of Common Stock

On July 19, 2019, the Company completed a public offering in which 1,587,000 shares of its common stock, including the underwriters' exercise in full of an option to purchase an additional 207,000 shares, were sold to the public at a price of $87.00 per share (the "Stock Offering"). The net proceeds of the Stock Offering, after deducting underwriting discounts and commissions and other estimated offering expenses payable by the Company, were approximately $131.1 million.

On May 3, 2019, the Company completed a public offering in which 3,144,531 shares of its common stock, which includes the underwriters' exercise in full of an option to purchase up to an additional 410,156 shares, were sold to the public at a price of $64.00 per share. The total proceeds received by the Company from this offering, net of underwriting discounts and commissions and other estimated offering expenses payable by the Company, totaled approximately $189.6 million.

Stock Option and Incentive Plans

At the Company's 2018 annual meeting of shareholders held on May 16, 2018, the Company's shareholders approved the 2018 Stock Option and Incentive Plan (the "2018 Plan"). Under the 2018 Plan the number of shares of the Company's common stock that are reserved and available for issuance is 2,778,000 plus the number of shares of common stock available for issuance under the Company's Amended and Restated 2012 Stock Option and Incentive Plan (the "2012 Plan"). The shares of common stock underlying any awards under the 2018 Plan and 2012 Plan (together, the "Plans") 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 2018 Plan. At September 30, 2020, 2,325,314 shares were available for future grant under the 2018 Plan.

Stock-Based Compensation

For the three months ended September 30, 2020 and 2019, th e Company recorded stock-based compensation expense of $4.2 million and $3.2 million, respectively, for share-based awards granted under the Plans. For the nine months ended September 30, 2020 and 2019, the Company recorded stock-based compensation expense of $12.5 million and $9.5 million, respectively. The following table presents stock-based compensation expense in the Company's consolidated statements of comprehensive income (loss):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
	(Amounts in thousands)			
Cost of product revenue	$ 563	$ 375	$ 1,421	$ 992
Research and development	326	351	1,092	992
Selling, general and administrative	3,336	2,449	9,979	7,475
Total stock-based compensation	$ 4,225	$ 3,175	$ 12,492	$ 9,459

The 2018 Plan allows for the granting of incentive and nonqualified options to purchase shares of common stock, restricted stock 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 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 ("RSUs") 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 September 30, 2020, options to purchase 723,914 shares and 675,567 stock units were outstanding under the Plans.

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 RSUs. 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. The Company issues performance stock units to certain employees that are tied to company and/or individual performance metrics and 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 nine months ended September 30, 2020 under the Plans is summarized below:

	Shares	Weighted average exercise price	Weighted-Average Remaining Contractual Term (in Years)	Aggregate Intrinsic Value (in Thousands)
Options outstanding at December 31, 2019	957,559	$ 30.81		
Granted	69,698	$ 104.61		
Exercised	(303,343)	$ 23.37		
Forfeited/expired/cancelled	—	$ —		
Options outstanding at September 30, 2020	723,914	$ 41.03	7.02	$ 77,102
Options exercisable at September 30, 2020	339,191	$ 31.00	6.05	$ 39,528
Vested and expected to vest at September 30, 2020 (1)	693,689		6.98	$ 74,178

(1) Represents the number of vested options as of September 30, 2020 plus the number of unvested options expected to vest as of September 30, 2020 based on the unvested outstanding options at September 30, 2020 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 September 30, 2020, the last business day of the third quarter of 2020, of $147.54 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 September 30, 2020. The aggregate intrinsic value of stock options exercised during the nine months ended September 30, 2020 and 2019 was $30.7 million and $5.2 million, respectively.

The weighted average grant date fair value of options granted during the nine months ended September 30, 2020 and 2019 was $48.13 and $30.07, respectively. The total fair value of stock options that vested during the nine months ended September 30, 2020 and 2019 was $2.6 million and $2.9 million, respectively.

The fair value of stock units is calculated using the closing price of the Company's common stock on the date of grant. Information regarding stock unit activity, which includes activity for restricted stock units and performance stock units, for the nine months ended September 30, 2020 under the Plans is summarized below:

	Shares	Weighted-Average Remaining Contractual Term (in Years)	Aggregate Intrinsic Value (in Thousands)
Unvested at December 31, 2019	734,984		
Awarded	187,942		
Vested	(225,204)		
Forfeited/expired/cancelled	(22,155)		
Unvested at September 30, 2020	675,567	3.39	$ 99,673
Vested and expected to vest at September 30, 2020 (1)	650,436	3.20	$ 95,965

(1) Represents the number of vested stock units as of September 30, 2020 plus the number of unvested stock units expected to vest as of September 30, 2020 based on the unvested outstanding stock units at September 30, 2020 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 September 30, 2020, the last business day of the third quarter of 2020, of $147.54 per share, as stock units do not have an exercise price) that would have been received by the stock unit holders had all holders exercised on September 30, 2020. The aggregate intrinsic value of stock units vested during the nine months ended September 30, 2020 and 2019 was $25.0 million and $15.5 million, respectively.

The weighted average grant date fair value of stock units vested during the nine months ended September 30, 2020 and 2019 was $66.00 and $33.46, respectively. The total fair value of stock units that vested during the nine months ended September 30, 2020 and 2019 was $9.8 million and $7.6 million, respectively.

As of September 30, 2020, there was $47.0 million 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 3.61 years. The Company expects 1,833,239 unvested options and stock units to vest over the next five years.

10. Commitments and Contingencies

Licensing and Research Agreements

The Company licenses certain technologies that are, or may be, incorporated into its technology under several agreements and also has entered into several clinical research agreements which require the Company to fund certain research projects. Generally, the license agreements require the Company to pay annual maintenance fees and royalties on product sales once a product has been established using the technologies. Research and development expenses associated with license agreements were immaterial amounts for the three and nine months ended September 30, 2020 and 2019.

In June 2018, the Company secured an agreement with Navigo Proteins for the exclusive co-development of multiple affinity ligands for which Repligen holds commercialization rights. The Company is manufacturing and has agreed to supply the first of these ligands, NGL-Impact ®, exclusively to Purolite Life Sciences ("Purolite"), who will pair the Company's high-performance ligand with Purolite's agarose jetting base bead technology used in their Jetted A50 Protein A resin product. The Company also signed a long-term supply agreement with Purolite for NGL-Impact and other potential additional affinity ligands that may advance from the Company's Navigo collaboration. In September 2020, Repligen and Navigo Proteins successfully completed co-development of an affinity ligand targeting the SARS-CoV-2 spike protein, to be utilized in the purification of COVID-19 vaccines. The Company has proceeded with scaling up and manufacturing this ligand and the development and validation of the related affinity chromatography resin, which will be marketed by Repligen. The Navigo and Purolite agreements are supportive of the Company's strategy to secure and reinforce the Company's proteins business. The Company made royalty payments to Navigo of $0.2 million and $0.4 million during the three and nine months ended September 30, 2020 , respectively .

11. Accumulated Other Comprehensive Loss

The following shows the changes in the components of accumulated other comprehensive loss for the nine months ended September 30, 2020 which consisted of only foreign currency translation adjustments for the periods shown (amounts in thousands):

	Foreign Currency Translation Adjustment
Balance as of December 31, 2019	$ (15,027)
Other comprehensive income	5,304
Balance as of September 30, 2020	$ (9,723)

12. Income Taxes

The Company's effective tax rate for the three and nine months ended September 30, 2020 was 18.0% and 9.5%, compared to 0.7% and 18.3% for the corresponding periods in the prior year. The effective tax rates for the three and nine months ended September 30, 2020 and 2019 were lower than the U.S. statutory rate of 21% primarily due to windfall benefits on stock option exercises and the vesting of stock units.

The Company is subject to a territorial tax system under the Tax Cuts and Jobs Act ("TCJA") enacted in December 2017, in which the Company is required to provide for tax on Global Intangible Low-Taxed Income ("GILTI") earned by certain foreign subsidiaries. The Company has adopted an accounting policy to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense.

On March 27, 2020, President Trump signed the $2.2 trillion bipartisan Coronavirus Aid, Relief, and Economic Security ("CARES") Act. The CARES Act, the third congressional bill to address COVID-19, provides for loans and other benefits to businesses, expanded unemployment insurance, direct payments to those with middle-income and below wages, new appropriations funding for healthcare and other priorities, and tax changes, including deferrals of employer payroll tax

liabilities, coupled with an employee retention tax credit and rollbacks of TCJA limitations on net operating losses ("NOLs") and the Section 163(j) business interest limitation and a TCJA technical correction on qualified improvement property. The Company evaluated the provisions of the CARES Act and no provision had a material effect on the Company's financial position or results of operations at September 30, 2020 and the three and nine months then ended.

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

Jurisdiction	Fiscal Years Subject to Examination
United States - federal and state	2016-2019
Sweden	2013-2019
Germany	2019
Netherlands	2013-2019

13. Earnings Per Share

The Company reports earnings per share in accordance with ASC 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, performance stock units 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. In periods when the Company has a net loss, stock awards are excluded from the calculation of earnings per share as their inclusion would have an antidilutive effect.

Basic and diluted weighted average shares outstanding were as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
	(Amounts in thousands, except per share data)			
Net income	$ 14,552	$ 1,659	$ 40,228	$ 17,807
Weighted average shares used in computing net income per share - diluted	52,545	50,852	52,341	47,087
Effect of dilutive shares:				
Stock options and restricted stock awards	916	957	951	843
Dilutive effect of unvested performance stock units	8	—	8	—
Dilutive potential common shares	924	957	959	843
Weighted average shares used in computing net income per share - diluted	53,469	51,809	53,300	47,930
Earnings per share:				
Basic	$ 0.28	$ 0.03	$ 0.77	$ 0.38
Diluted	$ 0.27	$ 0.03	$ 0.75	$ 0.37

At September 30, 2020, there were outstanding options to purchase 723,914 shares of the Company's common stock at a weighted average exercise price of $41.03 per share and 675,567 shares of common stock issuable upon the vesting of stock units, which include RSUs and performance stock units. For the three and nine months ended September 30, 2020, 60,202 and 117,160 shares of the Company's common stock 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 September 30, 2019, there were outstanding options to purchase 959,916 shares of the Company's common stock at a weighted average exercise price of $30.44 per share and 740,213 shares issuable upon the vesting of stock units. For the three and nine months ended September 30, 2019, 47,705 and 85,503 shares of the Company's common stock 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 2016 Notes, the Company had a choice to settl e the conversion obligation for the 2016 Notes in cash, shares or any combination of the two. During the third quarter of 2019 , the Company settled the remaining 2016 Notes for a total aggregate principal of $ 115.0 million and 2,316,200 shares of its common stock. As of March 31 , 2019 , the par value of the 2016 Notes is not included in the calculation of diluted earnings per share, but the dilutive effect of the conversion premium is considered in the calculation of diluted earnings per share using the treasury stock method. The dilutive impact of the 2016 Notes was based on the difference between the Company's current period average stock price and the conversion price of the 2016 Notes, provided there was a premium.

In July 2019, the Company issued $287.5 million aggregate principal amount of the 2019 Notes. As provided by the terms of the indenture underlying the 2019 Notes, conversion of the 2019 Notes will be settled in cash, shares of the Company's common stock or a combination thereof, at the Company's election. As of September 30, 2020, the 2019 Notes were not convertible. The Company currently intends to settle the par value of the 2019 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 the 2019 Notes. Accordingly, the par value of the 2019 Notes is not included in the calculation of diluted income per share, but the dilutive effect of the conversion premium is considered in the calculation of diluted net income per share using the treasury stock method. The dilutive impact of the 2019 Notes is based on the difference between the Company's current period average stock price and the conversion price of the 2019 Notes, provided there is a premium. Pursuant to this accounting standard, there is no dilution from the accreted principal of the 2019 Notes for the three and nine months ended September 30, 2020.

14. Related Party Transactions

Certain facilities leased by Spectrum are owned by Roy Eddleman, the former owner of Spectrum. As of September 30, 2020, Mr. Eddleman owned greater than 5% of the Company's outstanding shares and the Company considers him to be a related party. The lease amounts paid to this shareholder prior to the public offering were negotiated in connection with the Spectrum Acquisition. The Company incurred rent expense totaling $0.1 million and $0.5 million for the three and nine months ended September 30, 2020 related to these leases.

15. Segment Reporting

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

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

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Revenue by customers' geographic locations:				
North America	50%	54%	48%	51%
Europe	36%	33%	38%	37%
APAC /Other	14%	13%	14%	12%
Total revenue	100%	100%	100%	100%

Concentrations of Credit Risk and Significant Customers

Financial instruments that subject the Company to significant concentrations of credit risk primarily consist of cash and cash equivalents, marketable securities and accounts receivable. Per the Company's investment policy, cash equivalents and marketable securities are invested in financial instruments with high credit ratings and credit exposure to any one issue, issuer (with the exception of U.S. treasury obligations) and type of instrument is limited. At September 30, 2020 and December 31, 2019, the Company had no investments associated with foreign exchange contracts, options contracts or other foreign hedging arrangements.

Concentration of credit risk with respect to accounts receivable is limited to customers to whom the Company makes significant sales. While a reserve for the potential write-off of accounts receivable is maintained, the Company has not written off any significant accounts to date. To control credit risk, the Company performs regular credit evaluations of its customers' financial condition.

Revenue from significant customers that represent 10% or more of the Company's total revenue is as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Cytiva (formerly GE Healthcare)	N/A	N/A	N/A	12%
MilliporeSigma	N/A	14%	11%	14%

There were no accounts receivable balances as of September 30, 2020 representing 10% or more of the Company's total trade accounts receivable and royalties and other receivable balances. As of December 31, 2019, the accounts receivable balance with Cytiva (formerly GE Healthcare) represented 18% of the Company's total trade accounts receivable and royalties and other receivables balances.

16. Subsequent Events

Acquisition of Non-Metallic Solutions, Inc.

On October 15, 2020, the Company entered into a Stock Purchase Agreement with Non-Metallic Solutions, Inc. ("NMS"), a Massachusetts corporation, and William Malloneé and Derek Masser, the legal and beneficial owners of NMS, to purchase NMS, which transaction subsequently closed on October 20, 2020 (the "NMS Acquisition").

NMS, which is headquartered in Auburn, Massachusetts, is a manufacturer of fabricated plastics, custom containers, and related assemblies and components used in the manufacturing of biologic drugs. NMS's products will complement and expand Repligen's single-use product offerings.

The Company will account for the NMS Acquisition as a purchase of a business under the acquisition method of accounting and has engaged a third-party valuation firm to assist with the valuation of the business acquired. The estimated purchase price allocation for the NMS Acquisition will be included in the Annual Report on Form 10-K for the period ended December 31, 2020. As disclosed in the Quarterly Report on Form 10-Q for the period ended June 30, 2020, the Company voluntarily adopted the amendments to financial disclosure requirements around the significance tests in the "significant subsidiaries" definition in Rule 1-02(w), Securities Act Rule 405, and Exchange Act Rule 12b-2. As a result, the Company determined that NMS is not a significant subsidiary and therefore no separate financial statements are required.

Proposed Acquisition of ARTeSYN Biosolutions

On October 27, 2020, the Company executed an Equity and Asset Purchase Agreement ("Purchase Agreement") with ARTeSYN Biosolutions Holdings Ireland Limited, a company organized under the laws of Ireland ("ARTeSYN"), Third Creek Holdings, LLC, a Nevada limited liability company, Alphinity, LLC, a Nevada limited liability company ("Alphinity", and together with Third Creek Holdings, LLC the "Sellers"), and Michael Gagne, solely in his capacity as the representative of the Sellers, pursuant to which the Company will acquire (i) all of the outstanding equity securities of ARTeSYN and (ii) certain assets from Alphinity related to the business of ARTeSYN (collectively, the "ARTeSYN Acquisition") for approximately $200 million, comprised of approximately $130 million in cash to Third Creek and Alphinity and approximately $70 million in Repligen common stock to Third Creek. Subject to certain closing conditions, including the expiration and termination of the waiting period under the Hart-Scott Rodino Antitrust Improvements Act of 1976, as amended, the transaction is expected to close in the fourth quarter of 2020.

ARTeSYN, headquartered in Waterford, Ireland, is a biosystems innovator that has had success with its single-use chromatography and filtration systems, which are considered the gold standard in downstream bioprocessing due to their performance, automation and low hold-up volumes. The proposed ARTeSYN Acquisition, combined with the recent acquisitions of EMT and NMS, further establishes Repligen as a premier player in single-use systems and associated integrated flow path assemblies. ARTeSYN has established downstream processing leadership with a suite of state of the art single-use systems for chromatography, filtration, continuous manufacturing and media/buffer prep workflows. In addition, the Company has integrated unique flow path assemblies utilizing EMT's silicone extrusion and molding technology, to deliver highly differentiated, low hold-up volume systems that minimize product loss during processing.

The Company will account for the ARTeSYN Acquisition as a purchase of a business under ASC 805. Under the acquisition method of accounting, the net assets of ARTeSYN will be recorded as of the acquisition date, at their respective fair values, and consolidated with those of the Company. The Company has engaged a third-party valuation firm to assist with the valuation of the business acquired, which is expected to be completed in the fourth quarter of 2020. The preparation of the valuation requires the use of significant assumptions and estimates. Critical estimates will include, but are not limited to, future expected cash flows, including projected revenues and expenses, and the applicable discount rates. Actual results may differ from these estimates.

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 global life sciences company that develops and commercializes highly innovated bioprocessing technologies and systems that increase efficiencies and flexibility in the process of manufacturing biological drugs.

As the overall market for biologics continues to grow and expand, our customers – primarily large biopharmaceutical companies and contract development and manufacturing organizations – face critical production cost, capacity, quality and time pressures. Built to address these concerns, our products are helping to set new standards for the way biologics are manufactured. We are committed to inspiring advances in bioprocessing as a trusted partner in the production of critical biologic drugs – including monoclonal antibodies ("mAb"), recombinant proteins, vaccines and gene therapies – that are improving human health worldwide.

We currently operate as one bioprocessing business, with a comprehensive suite of products to serve both upstream and downstream processes in biological drug manufacturing. Building on over 35 years of industry expertise, we have developed a broad and diversified product portfolio that reflects our passion for innovation and the customer-first culture that drives our entire organization. We continue to capitalize on opportunities to maximize the value of our product platform through both organic growth initiatives (internal innovation and commercial leverage) and targeted acquisitions.

Our Products

Our bioprocessing business is comprised of four main franchises, three of which we sell directly to end-users (Chromatography, Filtration and Process Analytics) and one that we sell primarily through supply agreements (Proteins).

Direct-to-Customer Products

Since 2012, we have significantly expanded our direct-to-customer presence through our Chromatography, Filtration and Process Analytics franchises, each of which includes novel and differentiated technologies. We have diversified and grown our direct-to-customer product offering through internal innovation and through strategic, accretive acquisitions of assets or businesses that leverage existing product lines and/or expand our customer and geographic scope.

To support our sales growth goals for these products, we make ongoing investments in our commercial organization, our research and development ("R&D") team and our manufacturing capacity. Our commercial and R&D teams work together to develop and launch new products and applications that address specific biomanufacturing challenges, and to build new markets for acquired technologies. We have seven key manufacturing sites across the United States, Sweden and Germany, with additional capacity being added by the end of 2021 in the Netherlands. We regularly evaluate and invest in capacity as needed to ensure timely deliveries and to stay ahead of increased customer demand for our products.

A substantial piece of our revenue comes from consumable and/or single-campaign ("single-use") products as compared to associated equipment. The customization, scalability and plug-and-play convenience of consumable and/or single-use products, and in many cases the closed nature of our technologies, make them ideal for use in biologics manufacturing processes where contamination risk is a critical concern of our customers.

Chromatography

Our Chromatography franchise includes a number of products used in downstream purification, development, manufacturing and quality control of biological drugs. The main driver of growth in this portfolio is our OPUS ® pre-packed column product line.

Additional chromatography products include our affinity capture resins, such as CaptivA ® Protein A resins, that are used in a small number of commercial drug processes and our 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.

OPUS Pre-Packed Columns

Our Chromatography franchise features a wide range of OPUS columns, which we deliver to our customers sealed and pre-packed with their choice of resin. These are single-use or multiple-use disposable columns that replace the use of customer-packed glass columns used in downstream purification processes. By designing OPUS columns to be a technologically advanced and flexible option for the purification of biologics from process development through clinical and commercial-scale manufacturing, Repligen has become a leader in the pre-packed column ("PPC") market. Our biomanufacturing customers value the significant cost savings that OPUS columns deliver by reducing set up time, labor, equipment and facility costs – in addition to delivering product consistency and "plug and play" convenience.

We launched our first production-scale OPUS columns in 2012 and have since added larger diameter options that scale up to use with 2,000 liter bioreactors. Our OPUS 80R column is the largest available PPC on the market for use in late-stage clinical or commercial purification processes. We have also introduced next-generation features such as a resin recovery port on our larger columns, which allows our customers to remove and reuse the recovered resin in other applications. We believe the OPUS 5-80R product line is the most flexible and platformable PPC product offered in the marketplace today, and is serving the purification needs of customers manufacturing monoclonal antibodies ("mAb") and other biologics such as vaccines and cell and gene therapies ("C&GT").

In addition to our larger scale OPUS columns, our portfolio includes our smaller-scale OPUS columns, including specifically RoboColumn ®, MiniChrom ™ and ValiChrom ™ columns for process development and validation. These columns are used in high-throughput process development screening, viral clearance validation studies and scale down validation of chromatography processes.

We maintain customer-facing centers in both the United States and Europe for OPUS columns, and offer our customers an unmatched ability to pack any of over 100 resins in our OPUS 5-80R range and any of over 300 resin choices in our small-scale OPUS columns.

Other Chromatography

Our Chromatography portfolio also includes ELISA kits, which are analytical test kits to quantitate the proteins and growth factors, and chromatography resins, including our CaptivA brand.

Filtration

XCell ATF ® Cell Retention Systems

Our Filtration products offer a number of advantages to manufacturers of biologic drugs and are used in development, clinical and commercial-scale production. Our XCell Alternating Tangential Flow ("ATF") systems are used primarily in upstream perfusion (continuous) cell culture processing.

XCell ATF is a cell retention technology. The system is comprised of an advanced hollow fiber ("HF") filtration device, a low shear pump and a controller. The XCell ATF system is connected to a bioreactor and enables the cell culture to be run continuously, with cells being retained in the bioreactor, fresh nutrients (cell culture media) being fed into the reactor continuously and clarified biological product and cell waste being removed continuously. The cells are maintained in a consistent nutrient-rich environment and can reach cell densities two- and three-times higher than those achieved by standard fed-batch culture. By continuously removing waste products from the fermenter, the XCell ATF systems routinely increases cell densities to two- or three-times the levels achieved by standard fed-batch culture. As a result, product yield is increased, which improves facility utilization and can reduce the size of a bioreactor required to manufacture a given volume of biologic drug product. XCell ATF systems are available in a wide range of sizes that can easily scale from laboratory use through full production with bioreactors as large as 5,000 liters.

Through internal innovation, we developed and launched single-use formats of the original stainless steel XCell ATF devices to address increasing industry demand for single-use sterile systems with "plug-and-play" technology. The XCell ATF device is now available to customers in both its original configuration (steel housing and single-use filters) in all sizes (2, 4, 6 and 10), and/or as a single-use device (disposable housing/filter combination) in most sizes (2, 6, and 10). The availability of XCell ATF technology in a single-use format eliminates the time intensive workflow associated with autoclaving, leading to an 80% reduction in implementation speed. The single-use format also enables our customers to accelerate evaluations of the product with a lower initial overall cost of ownership.

In September 2018, we entered into a collaboration agreement with industry leader Sartorius Stedim Biotech ("SSB") to integrate our XCell ATF controller technology into SSB's BIOSTAT ® STR large-scale, single-use bioreactors, to create novel perfusion-enabled bioreactors.

TangenX ® Flat Sheet Cassettes

In December 2016, we acquired TangenX ™ Technology Corporation ("TangenX"), balancing our upstream XCell ATF systems with a portfolio of flat-sheet tangential flow filtration ("TFF") cassettes used in downstream biologic drug concentration and formulation processes. The TangenX product portfolio includes our single-use SIUS ™ brand, providing customers with a high-performance, cost saving alternative to reusable TFF cassettes.

TFF is a rapid and efficient method for the concentration and formulation of biomolecules that is widely used in many applications in biopharmaceutical development and manufacturing. SIUS cassettes are the only purpose built single-use TFF cassettes on the market. The cassette features a high performing membrane and unique cartridge construction that enables a lower price point. Each disposable cassette is delivered pre-sanitized and ready to be equilibrated and used for tangential flow, ultrafiltration and diafiltration applications. Use of SIUS TFF cassettes eliminates non-value-added steps of cleaning, testing between uses, storage and flushing required in reusable TFF products, providing cost and time savings. The cassettes are interchangeable with filter hardware from multiple manufacturers, simplifying customer trial and adoption of SIUS products.

Spectrum ® Hollow Fibers

We acquired Spectrum Life Sciences LLC ("Spectrum") and its subsidiaries in August 2017 to strengthen our filtration business with the addition of a leading portfolio of HF filtration solutions, including fully integrated KrosFlo ® TFF Systems with Konduit sensing and ProConnex ® Flow Path single-use assemblies. KrosFlo family of TFF systems for product concentration is fully scalable from 2 milliliters to 5,000 liters – from lab-scale to commercial manufacturing. Designed for purification and formulation applications, KrosFlo Systems enable robust downstream ultrafiltration and microfiltration.

We also gained the Spectra/Por ® portfolio of laboratory and process dialysis products and in 2019, we launched the SpectraFlo ™ Dynamic Dialysis Systems. Also, in 2019 we introduced the KrosFlo ® TFDF ™ (Tangential Flow Depth Filtration) Systems, which we believe have the potential to disrupt and displace traditional harvest clarification operations. The KrosFlo TFDF system includes control hardware, novel high throughput tubular depth filters and ProConnex single-use TFDF flow paths. When used for cell culture clarification, single-use KrosFlo TFDF technology delivers unprecedented high flux (>1,000 LMH), high capacity, low turbidity, and minimal dilution, making the technology a high-performance alternative to traditional centrifugation and depth filtration approaches to harvest clarification. TFDF technology also provides benefits such as low hold-up volume, high recovery, small footprint, simple set up and disposal, scalability and reduced process time.

The Spectrum product line of HF filters and systems are used in bench-top through commercial-scale processes, primarily for the filtration, purification and concentration of biologics and diagnostic products. Our KrosFlo filtration systems and equipment offer both standard and customized solutions to bioprocessing customers, with particular strength in consumable and single-use offerings.

With the acquisition of Spectrum, we substantially increased our direct sales presence in Europe and Asia, and we diversified our end markets to include all biologic classes, including mAb, vaccines, recombinant proteins and gene therapies.

Other Filtration

In 2018, we introduced our Konduit monitor to automate concentration and buffer exchange. We have broadened the application for Konduit monitor to include use with both HF TFF from Spectrum and our TangenX flat sheet TFF systems. We also self-manufacture HF filters that are used in our XCell ATF, KrosFlo TFF and KrosFlo TFDF systems.

On July 13, 2020, we consummated the acquisition of Engineered Molding Technology LLC ("EMT"), a New York liability company, and added EMT's silicone-based, single-use components and manifolds to our filtration franchise. These products are key components in single-use filtration and chromatography systems and will help expand the Company's line of single-use ProConnex flow paths, streamline our supply chain for ATF and provide more flexibility we scale and expand our single-use and systems portfolios.

Process Analytics

In May 2019, we consummated our acquisition of C Technologies, Inc. ("C Technologies") and added a fourth franchise, Process Analytics, to our bioprocessing business. Our Process Analytics products complement and support our Filtration, Chromatography and Proteins franchises as they allow end-users to make at-line or in-line absorbance measurements allowing for the determination of protein concentration in filtration, chromatography formulation and fill-finish applications.

SoloVPE ® Device

Our SoloVPE Slope Spectroscopy ® system is the industry standard for offline and at-line absorbance measurements for protein concentration determination in process development, manufacturing and quality control settings.

FlowVPE ® Device

Our FlowVPE Slope Spectroscopy system enhances the power of Slope Spectroscopy and provides in-line protein concentration measurement for filtration, chromatography and fill-finish applications. A key benefit of this in-line solution is the ability to monitor a manufacturing process in real time. We are developing a next-generation FlowVPE to incorporate GMP-compliant software for production-scale biologics manufacturing.

Use of VPE Slope Spectroscopy delivers multiple process benefits for our biopharmaceutical manufacturing customers, compared to traditional UV-Vis approaches. Key benefits include: the elimination of manual dilutions and sample transfers from process development/manufacturing to labs, rapid time to results (minutes versus hours), improved precision, built-in data quality for improved reporting and validation, and ease of use.

OEM Products (Proteins)

Our Proteins products are represented by our Protein A affinity ligands, which are a critical component of Protein A chromatography resins used in downstream purification of mAb, and cell culture growth factor products, which are a key component of cell culture media used in upstream bioprocessing to increase cell density and improve product yield.

Proteins - Ligands

Through our Proteins business, we are a leading provider of Protein A affinity ligands and cell culture growth factors to life sciences companies. Protein A ligands are an essential "binding" component of Protein A affinity chromatography resins used in the purification of virtually all monoclonal antibody-based drugs on the market or in development. We manufacture multiple forms of Protein A ligands under long-term supply agreements with major life sciences companies including GE Healthcare ("GE"), MilliporeSigma and Purolite Life Sciences ("Purolite"), who in turn sell their Protein A chromatography resins to end users (mAb manufacturers). We have two manufacturing sites supporting overall global demand for our Protein A ligands: one in Lund, Sweden and another in Waltham, Massachusetts.

Protein A chromatography resins are considered the industry standard for purification of antibody-based therapeutics due to the ability of the Protein A ligand to very selectively bind to or "capture" antibodies from crude protein mixtures. Protein A resins are packed into the first chromatography column of typically three columns used in a mAb purification process. As a result of Protein A's high affinity for antibodies, the mAb product is highly purified and concentrated within this first capture step before moving to polishing steps.

In June 2018, we entered into an agreement with Navigo Proteins GmbH ("Navigo") 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, who will pair our high-performance ligand with Purolite's agarose jetting base bead technology used in their Jetted A50 Protein A resin product. We also signed a long-term supply agreement with Purolite for NGL-Impact A and potential additional affinity ligands that may advance from our Navigo collaboration. The Navigo and Purolite agreements are supportive of our strategy to secure and reinforce our Proteins franchise.

Proteins - Growth Factors

Most biopharmaceuticals are produced through an upstream mammalian cell culture process. In order to stimulate increased cell growth and maximize overall yield from a bioreactor, manufacturers often add growth factors, such as insulin, to their cell culture media. Our cell culture growth factor additives include LONG ® R 3 IGF 1 ("LR3"), our insulin-like growth factor that has been shown to be up to 100 times more biologically potent than insulin (the industry standard), thereby increasing recombinant protein production in cell culture fermentation applications. LR3 is primarily sold through a distribution partnership with MilliporeSigma.

2020 Acquisitions

Proposed Acquisition of ARTeSYN Biosolutions

On October 27, 2020, the Company entered into an Equity and Asset Purchase Agreement ("Purchase Agreement") with ARTeSYN Biosolutions Holdings Ireland Limited, a company organized under the laws of Ireland ("ARTeSYN"), Third Creek Holdings, LLC, a Nevada limited liability company, Alphinity, LLC, a Nevada limited liability company ("Alphinity", and together with Third Creek Holdings, LLC the "Sellers"), and Michael Gagne, solely in his capacity as the representative of the Sellers, pursuant to which the Company will acquire (i) all of the outstanding equity securities of ARTeSYN and (ii) certain assets from Alphinity related to the business of ARTeSYN (collectively, the "ARTeSYN Acquisition") for approximately $200 million, comprised of approximately $130 million in cash to Third Creek and Alphinity and approximately $70 million in Repligen common stock to Third Creek. Subject to certain closing conditions, including the expiration and termination of the waiting period under the Hart-Scott Rodino Antitrust Improvements Act of 1976, as amended, the transaction is expected to close in the fourth quarter of 2020.

ARTeSYN, headquartered in Waterford, Ireland, is a biosystems innovator that has had success with its single-use chromatography and filtration systems, which are considered the gold standard in downstream bioprocessing due to their performance, automation and low hold-up volumes. The proposed ARTeSYN Acquisition, combined with the recent acquisitions of EMT and Non-Metallic Solutions, Inc., further establishes Repligen as a premier player in single-use systems and associated integrated flow path assemblies. ARTeSYN has established downstream processing leadership with a suite of state of the art single-use systems for chromatography, filtration, continuous manufacturing and media/buffer prep workflows. In addition, the Company has integrated unique flow path assemblies utilizing EMT's silicone extrusion and molding technology, to deliver highly differentiated, low hold-up volume systems that minimize product loss during processing.

Non-Metallic Solutions, Inc.

On October 15, 2020, the Company entered into a Stock Purchase Agreement with Non-Metallic Solutions, Inc. ("NMS"), a Massachusetts corporation, and William Malloneé and Derek Masser, the legal and beneficial owners of NMS, to purchase NMS, which transaction subsequently closed on October 20, 2020 (the "NMS Acquisition").

NMS, which is headquartered in Auburn, Massachusetts, is a manufacturer of fabricated plastics, custom containers, and related assemblies and components

used in the manufacturing of biologic drugs. NMS's products will complement and expand Repligen's single-use product offerings.

Engineered Molding Technology

On June 26, 2020, we entered into a Membership Interest Purchase Agreement with EMT and Michael Pandori and Todd Etesse, the legal and beneficial owners of EMT to purchase EMT, which transaction subsequently closed on July 13, 2020 (the "EMT Acquisition").

EMT, which is headquartered in Clifton Park, New York, is an innovator and manufacturer of single-use silicone assemblies and components used in the manufacturing of biologic drugs. EMT's standard and customer molding and over-molded connectors and silicone tubing products are key components in single-use filtration and chromatography systems. Its products complement and expand our single-use product offerings.

The EMT Acquisition was accounted for as a purchase of a business under Accounting Standards Codification No. ("ASC") 805, *"Business Combinations."* The cash paid for the EMT Acquisition was $28.5 million, which will be consideration transferred under ASC 805. This includes $2.2 million deposited into escrow for indemnification obligations of the sellers.

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 a description of our critical accounting policies that affect our more significant judgments and estimates used in the preparation of our consolidated financial statements, refer to Management's Discussion and Analysis of Financial Condition and Results of Operations and our significant accounting policies in Note 2 to the consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2019 filed with the SEC.

Results of Operations

The following discussion of the financial condition and results of operations should be read in conjunction with the accompanying consolidated financial statements and the related footnotes thereto.

Revenues

Total revenue for the three and nine months ended September 30, 2020 and 2019 were as follows:

	Three Months Ended September 30,		Increase/(Decrease)		Nine Months Ended September 30,		Increase/(Decrease)	
	2020	2019	$ Change	% Change	2020	2019	$ Change	% Change
	(Amounts in thousands, except for percentage data)							
Revenue:								
Products	$94,029	$69,419	$ 24,610	35.5%	$257,521	$200,701	$ 56,820	28.3%
Royalty and other	31	26	5	19.2%	91	70	21	30.0%
Total revenue	$94,060	$69,445	$ 24,615	35.4%	$257,612	$200,771	$ 56,841	28.3%

Product revenues

Since 2016, we have been increasingly focused on selling our products directly to customers in the pharmaceutical industry and to our contract manufacturers. Direct sales represented approximately 82% and 80% of our product revenue for the three months ended September 30, 2020 and 2019, respectively, and represented approximately 77% and 75% of our product revenue for the nine months ended September 30, 2020 and 2019, respectively. We expect that direct sales will continue to account for an increasing percentage of our product revenues, as the largest customer of our OEM products has begun to diversify its supply chain in 2020. Sales of our bioprocessing products can be impacted by the timing of large-scale production orders and the regulatory approvals for such antibodies, which may result in significant quarterly fluctuations.

Revenue from our chromatography products includes the sale of our OPUS chromatography columns, chromatography resins and ELISA test kits. Revenue from our filtration products includes the sale of our XCell ATF systems and consumables, KrosFlo filtration products, SIUS filtration products and the silicone-molded products offered by EMT, which we acquired on July 13, 2020. Revenue from protein products includes the sale of our Protein A ligands and cell culture growth factors. Revenue from our Process Analytics products includes the sale of our SoloVPE and FlowVPE systems and consumables. Other revenue primarily consists of revenue from the sale of our operating room products to hospitals, as well as freight revenue.

During the three and nine months ended September 30, 2020, product revenue increased by $24.6 million, or 35.5%, and $56.8 million, or 28.3%, as compared to the same periods of 2019. The increase is due to the continued adoption of our products by

our key bioprocessing customers, particularly our chromatography and filtration products. Beginning in the second quarter of 2020, we have experienced an increase in overall sales as a result of accelerated demand for our protein and filtration products. The demand was broad-based covering mAb, gene therapy and COVID-19 customers working on vaccines and therapeutics. We expect there will be a continued increase in direct sales through the remainder of 2020, especially from COVID-19 customers as they scale-up and move candidates through the clinical trial process. In addition, demand for our protein and ligands products increased during the three and nine months ended September 30, 2020, as compared to the same periods of 2019. 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. There was also a $14.6 million increase in revenue for the nine months ended September 30, 2020, as compared to the same periods of 2019 due to revenues generated by C Technologies. Since the acquisition date was in May 2019, only four months of revenue were included in the nine months ended September 30, 2019.

Royalty revenues

Royalty revenues in the three and nine months ended September 30, 2020 and 2019 relate to royalties received from a third-party systems manufacturer associated with our OPUS PD chromatography columns. Royalty revenues are variable and are dependent on sales generated by our partner.

Costs of product revenue and operating expenses

Total costs and operating expenses for the three and nine months ended September 30, 2020 and 2019 were comprised of the following:

	Three Months Ended September 30,		Increase/(Decrease)		Nine Months Ended September 30,		Increase/(Decrease)	
	2020	2019	$ Change	% Change	2020	2019	$ Change	% Change
	(Amounts in thousands, except for percentage data)							
Cost of product revenue	$39,626	$31,425	$ 8,201	26.1%	$108,471	$ 88,978	$ 19,493	21.9%
Research and development	4,422	5,427	(1,005)	(18.5%)	13,460	14,278	(818)	(5.7%)
Selling, general and administrative	29,051	24,629	4,422	18.0%	83,277	67,326	15,951	23.7%
Total costs and operating expenses	$73,099	$61,481	$ 11,618	18.9%	$205,208	$170,582	$ 34,626	20.3%

Cost of product revenue

Cost of product revenue increased 26.1% and 21.9% in the three and nine months ended September 30, 2020, compared to the same periods of 2019, due primarily to the increase in product revenue mentioned above and costs associated with higher product volume. An increase in manufacturing headcount resulted in higher employee-related costs for the three and nine months ended September 30, 2020, compared to the same periods of 2019. Additional facility costs, including personal protection equipment purchased for essential manufacturing personnel on site to protect against COVID-19, were also incurred during the three and nine months ended September 30, 2020 for which there were no comparable amounts in 2019.

Gross margins were 57.9% in both the three and nine months ended September 30, 2020. The gross margin for the three months ended September 30, 2020 includes $0.1 million of amortization of inventory step-up associated with the EMT Acquisition. The gross margins for the three and nine months ended September 30, 2019, which include $0.3 million and $1.5 million of amortization on inventory step-up associated with the C Technologies Acquisition in May 2019, were 54.7% and 55.7%, respectively. Excluding the step-up amortization, gross margins for the three and nine months ended September 30, 2019 were 55.2% and 56.4%. The increase in gross margins, excluding the inventory step-up amortization, in the three and nine months ended September 30, 2020, as compared to the same period of 2019, is due primarily to the increase in revenue mentioned above, and favorable product volumes and mix, partially offset by an increase in manufacturing headcount subsequent to September 30, 2019. Gross margins may fluctuate in future quarters based on expected production volume and product mix.

Research and development expenses

Research and development (“R&D”) expenses are related to bioprocessing products, which include personnel, supplies and other research expenses. Due to the size of the Company and the fact that these various programs share personnel and fixed costs, we do not track all of our expenses or allocate any fixed costs by program, and therefore, have not provided historical costs incurred by project.

R&D expenses decreased 18.5% and 5.7% during the three and nine months ended September 30, 2020, compared to the same period of 2019. The decrease during the periods is primarily due to a decrease in R&D spending on projects, as most R&D personnel worked remotely for most of 2020 due to COVID-19. This is partially offset by a $1.2 million increase in R&D expenses year over year, related to C Technologies operations. The nine months ended September 30, 2020 only had four months of expenses since the acquisition was consummated on May 31, 2019.

We expect our R&D expenses for the remainder of 2020 to gradually increase to support new product development.

Selling, general and administrative expenses

Selling, general and administrative ("SG&A") expenses include the costs associated with selling our commercial products and costs required to support our marketing efforts, including legal, accounting, patent, shareholder services, amortization of intangible assets and other administrative functions.

During the three and nine months ended September 30, 2020, SG&A costs increased by $4.4 million, or 18.0%, and $16.0 million, or 23.7%, as compared to the same periods of 2019. The increase is partially due to the continued expansion of our customer-facing activities to drive sales of our bioprocessing products, and the continued buildout of our administrative infrastructure, primarily through increased headcount, to support expected future growth. Stock-based compensation expense and other employee-related costs increased during the three and nine months ended September 30, 2020, as compared to the same period in 2019, resulting from an increase in headcount and higher share prices period over period. In addition, $5.9 million of the increase in SG&A costs for the nine months ended September 30, 2020, was related to the C Technologies operations, which was acquired in May 2019. C Technologies' SG&A costs for the nine months ended September 30, 2020 include nine months of costs, compared to only four months in the same period of 2019.

Other expenses, net

The table below provides detail regarding our other expenses, net:

	Three Months Ended September 30,		Increase/(Decrease)		Nine Months Ended September 30,		Increase/(Decrease)	
	2020	2019	$ Change	% Change	2020	2019	$ Change	% Change
	(Amounts in thousands, except for percentage data)							
Investment income	$ 82	$ 1,898	$ (1,816)	(95.7%)	$ 1,699	$ 3,616	$ (1,917)	(53.0%)
Loss on extinguishment of debt	—	(5,650)	5,650	(100.0%)	—	(5,650)	5,650	(100.0%)
Interest expense	(3,052)	(2,857)	(195)	6.8%	(9,032)	(6,326)	(2,706)	42.8%
Other expenses	(248)	316	(564)	(178.5%)	(632)	(23)	(609)	2647.8%
Total other expense, net	$(3,218)	$(6,293)	$ 3,075	(48.9%)	$(7,965)	$(8,383)	$ 418	(5.0%)

Investment income

Investment income includes income earned on invested cash balances. The decrease of $1.8 million and $1.9 million for the three and nine months ended September 30, 2020, as compared to the same periods of 2019, was attributable to a decrease in interest rates on our average invested cash balances. In March 2020, in response to the outbreak of COVID-19 and to stay ahead of disruptions and economic slowdown, the Federal Reserve reduced federal funds rate to a range of 0.0% to 0.25%, which will continue to affect our investment income in future periods. Higher average invested cash balances during the three and nine months ended September 30, 2020, as compared to the same periods of 2019 due to the completion of a public offering and the issuance of our 2019 Notes during the third quarter of 2019, partially offset the decrease in interest rates mentioned above. We expect investment income to vary based on changes in the amount of funds invested and fluctuation of interest rates.

Loss on extinguishment of debt

The $5.6 million loss on extinguishment of debt in the three and nine months ended September 30, 2019, resulted from the settlement of our outstanding 2.125% Convertible Senior Notes due 2021 (the "2016 Notes"). The loss represents the difference between (i) the fair value of the liability component and (ii) the sum of the carrying value of the debt component and any unamortized debt issuance costs at the time of settlement.

Interest expense

Interest expense in the three and nine months ended September 30, 2020 is from our 0.375% Convertible Senior Notes due 2024 (the "2019 Notes"), which were issued in July 2019. Interest expense in the three and nine months ended September 30, 2019 is from our 2016 Notes, which were settled during the third quarter of 2019. Interest expense increased $0.2 million and $2.7 million for the three and nine months ended September 30, 2020, as compared to the same periods in 2019.

The amortization of debt issuance costs on the 2019 Notes was $2.8 million and $8.2 million for the three and nine months ended September 30, 2020. Amortization of debt issuance costs on the 2019 Notes was $2.1 million for both the three and nine months ended September 30, 2019. The amortization of the debt issuance costs on the 2016 Notes was $0.6 million and $2.8 million for the three and nine months ended September 30, 2019, respectively.

Contractual coupon interest incurred on the 2019 Notes for the three and nine months ended September 30, 2020 was $0.3 million and $0.8 million, respectively. Interest calculated based on the carrying value related to the 2019 Notes for both the three and nine months ended September 30, 2019 was $0.2 million. Contractual coupon interest incurred on the 2016 Notes was $0.1 million and $1.3 million in the three and nine months ended September 30, 2019. Since the 2016 Notes were settled during July 2019, interest no longer accrued on the 2016 Notes subsequent to their settlement.

Other expenses

The change in other expenses during the three and nine months ended September 30, 2020, compared to the same period of 2019, is primarily attributable to foreign currency losses related to amounts due from non-Swedish krona-based customers and vendors.

Income tax provision

Income tax provision for the three and nine months ended September 30, 2020 and 2019 was as follows:

	Three Months Ended September 30,		Increase/(Decrease)		Nine Months Ended September 30,		Increase/(Decrease)	
	2020	2019	$ Change	% Change	2020	2019	$ Change	% Change
	(Amounts in thousands, except for percentage data)							
Income tax provision	$3,191	$ 12	$ 3,179	26491.7%	$4,211	$3,999	$ 212	5.3%
Effective tax rate	18.0%	0.7%			9.5%	18.3%		

For the three and nine months ended September 30, 2020, we recorded an income tax expense of $3.2 million and $4.2 million, respectively. The effective tax rate was 18.0% and 9.5% for the three and nine months ended September 30, 2020 and is based upon the estimated income for the year ending December 31, 2020 and the composition of income in different jurisdictions and impacts of various discrete tax adjustments. The effective tax rate for the three and nine months ended September 30, 2020 was lower than the U.S. statutory rate of 21% primarily due to windfall benefits on stock option exercises and the vesting of stock units. We recorded a tax provision of less than $0.1 million and $4.0 million, respectively for the three and nine months ended September 30, 2019. The effective tax rate was 0.7% and 18.3% for the three and nine months ended September 30, 2019 and the composition of income in different jurisdictions and the impacts of various discrete tax adjustments. The effective tax rate for the three and nine months ended September 30, 2019 was lower than the U.S. statutory rate of 21% primarily due to windfall benefits on stock option exercise and the vesting of stock units.

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.

Non-GAAP adjusted income from operations

Non-GAAP adjusted income from operations is measured by taking income from operations as reported in accordance with GAAP and excluding acquisition and integration costs, intangible amortization and inventory step-up charges booked through our consolidated statements of comprehensive income (loss). The following is a reconciliation of income from operations in accordance with GAAP to non-GAAP adjusted income from operations for the three and nine months ended September 30, 2020 and 2019:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
	(Amounts in thousands)			
GAAP income from operations	$20,961	$ 7,964	$52,404	$30,189
Non-GAAP adjustments to income from operations:				
Acquisition and integration costs	1,849	2,953	6,536	9,573
Intangible amortization	3,925	3,900	11,677	9,562
Inventory step-up charges	144	314	144	1,483
Non-GAAP adjusted income from operations	$26,879	$15,131	$70,761	$50,807

Non-GAAP adjusted net income

Non-GAAP adjusted net income is measured by taking net income as reported in accordance with GAAP and excluding acquisition and integration costs, intangible amortization, inventory step-up charges, loss on extinguishment of debt, non-cash interest expense and the tax effects of these items. The following are reconciliations of net income in accordance with GAAP to non-GAAP adjusted net income for the three and nine months ended September 30, 2020 and 2019:

	Three Months Ended September 30,			
	2020		2019	
	Amount	Fully Diluted Earnings per Share	Amount	Fully Diluted Earnings per Share
	(Amounts in thousands, except per share data)			
GAAP net income	$14,552	$ 0.27	$ 1,659	$ 0.03
Non-GAAP adjustments to net income:				
Acquisition and integration costs	1,849	0.03	2,953	0.06
Intangible amortization	3,925	0.07	3,900	0.08
Loss on extinguishment of debt	—	—	5,650	0.11
Inventory step-up charges	144	0.00	314	0.01
Non-cash interest expense	2,759	0.05	2,631	0.05
Tax effect of intangible amortization and acquisition costs	(2,072)	(0.04)	(3,781)	(0.07)
Non-GAAP adjusted net income	$21,157	$ 0.40	$13,326	$ 0.26

	Nine Months Ended September 30,			
	2020		2019	
	Amount	Fully Diluted Earnings per Share	Amount	Fully Diluted Earnings per Share
	(Amounts in thousands, except per share data)			
GAAP net income	$40,228	$ 0.75	$17,807	$ 0.37
Non-GAAP adjustments to net income:				
Acquisition and integration costs	6,536	0.12	10,074	0.21
Intangible amortization	11,677	0.22	9,562	0.20
Inventory step-up charges	144	0.00	1,483	0.03
Loss on extinguishment of debt	—	—	5,650	0.12
Non-cash interest expense	8,174	0.15	4,863	0.10
Tax effect of intangible amortization and acquisition costs	(6,334)	(0.12)	(7,742)	(0.16)
Non-GAAP adjusted net income	$60,425	$ 1.13	$41,697	$ 0.87

* Per share totals may not add due to rounding.

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, acquisition and integration costs, inventory step-up charges and loss on extinguishment of debt booked through our consolidated statements of comprehensive income (loss). The following is a reconciliation of net income in accordance with GAAP to adjusted EBITDA for the three and nine months ended September 30, 2020 and 2019:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
	(Amounts in thousands)			
GAAP net income	$14,552	$ 1,659	$40,228	$17,807
Non-GAAP EBITDA adjustments to net income:				
Investment income	(82)	(1,898)	(1,699)	(3,616)
Interest expense	3,052	2,857	9,032	6,326
Tax provision	3,191	12	4,211	3,999
Depreciation	2,757	1,810	7,820	5,147
Amortization	3,953	3,928	11,760	9,644
EBITDA	27,423	8,368	71,352	39,307
Other non-GAAP adjustments:				
Acquisition and integration costs	1,849	2,953	6,536	10,074
Loss on extinguishment of debt	—	5,650	—	5,650
Inventory step-up charges	144	314	144	1,483
Adjusted EBITDA	$29,416	$17,285	$78,032	$56,514

Liquidity and Capital Resources

We have financed our operations primarily through revenues derived from product sales, the issuance of the 2016 Notes in May 2016 and our 2019 Notes (defined below) in July 2019 and the issuance of common stock in our July 2019, May 2019 and July 2017 public offerings. Our revenue for the foreseeable future will primarily be limited to our bioprocessing product revenue.

At September 30, 2020, we had cash and cash equivalents (excluding restricted cash) of $553.3 million compared to cash and cash equivalents (excluding restricted cash) of $528.4 million at December 31, 2019.

On July 19, 2019, the Company issued $287.5 million aggregate principal amount of 0.375% Convertible Senior Notes due 2024 (“2019 Notes”), which included the underwriters’ exercise in full of an option to purchase an additional $37.5 million aggregate principal amount of 2019 Notes (the “Notes Offering” and, together with the Stock Offering in July 2019 as mentioned in Note 9, *“Stockholders’ Equity”* included in this report, the “Offerings”). The net proceeds of the Notes Offering, after deducting underwriting discounts and commissions and other offering expenses payable by the Company, were $278.5 million. See Note 8,

"Convertible Senior Notes," included in this report for more information on this transaction. The Company utilized a portion of the proceeds from the Offerings to settle its outstanding 2016 Notes during the third quarter of 2019. On July 16, 2019, the Company entered into separate privately negotiated agreements with certain holders of the 2016 Notes to exchange an aggregate of $92.0 million principal aggregate amount of the 2016 Notes for shares of the Company's common stock, together with cash, in private placement transactions (the "Note Exchanges"). On July 19, 2019 and July 22, 2019, the Company used approximately $92.3 million (including $0.3 million of accrued interest) and 1,850,155 shares of its common stock valued at $161.0 million to settle the Note Exchanges for total consideration of $253.3 million, of which $163.6 million was allocated to the equity component of the 2016 Notes. The Company allocated the consideration transferred to the liability and equity components using the same proportions as the initial carrying value of the 2016 Notes.

During the third quarter of 2020, the closing price of the Company's common stock did not exceed 130% of the conversion price of the 2019 Notes for more than 20 trading days of the last 30 consecutive trading days of the quarter. Therefore, the 2019 Notes are not convertible at the option of the holders of the 2019 Notes during the fourth quarter of 2020 per the First Supplemental Indenture underlying the 2019 Notes. The 2019 Notes have a face value of $287.5 million and a carrying value of $240.9 million and are classified as long-term liabilities on the Company's consolidated balance sheet as of September 30, 2020.

We intend to use the remaining net proceeds from the Offerings for working capital and other general corporate purposes, including to fund possible acquisitions of, or investments in, complementary businesses, products, services and technologies, such as the acquisitions mentioned in Note 16, *"Subsequent Events,"* included in this report. It is the Company's policy and intent to settle the face value of the 2019 Notes in cash and any excess conversion premium in shares of our common stock.

Cash flows

	Nine Months Ended September 30,		Increase/(Decrease)
	2020	2019	$ Change
	(Amounts in thousands)		
Operating activities	$ 47,754	$ 49,542	$ (1,788)
Investing activities	(43,097)	(198,197)	155,100
Financing activities	7,078	485,047	(477,969)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	4,160	(7,785)	11,945
Net increase in cash, cash equivalents and restricted cash	$ 15,895	$ 328,607	$ (312,712)

Operating activities

For the nine months ended September 30, 2020, our operating activities provided cash of $47.8 million reflecting net income of $40.2 million and non-cash charges totaling $40.5 million primarily related to depreciation, amortization, deferred income taxes, non-cash interest expense and stock-based compensation charges. An increase in accounts receivable consumed $11.5 million of cash and was primarily driven by the 35.4% year-to-date increase in revenues. An increase in inventory manufactured of $22.8 million supports expected increases in future revenue. An increase in accounts payable and accrued liabilities of $1.1 million was primarily due to increased inventory purchases to support customer orders, offset by payment of acquisition-related bonuses for C Technologies during the second quarter of 2020. The remaining cash provided by operating activities resulted from favorable changes in various other working capital accounts.

For the nine months ended September 30, 2019, our operating activities provided cash of $49.5 million reflecting net income of $17.8 million and non-cash charges totaling $25.2 million primarily related to depreciation, amortization, non-cash interest expense, deferred taxes, loss on extinguishment of debt and stock-based compensation charges. An increase in accounts receivable consumed $6.7 million of cash and was primarily driven by the 41.3% year-to-date increase in revenues. An increase in inventory consumed $4.9 million to support future revenue, due to the addition of C Technologies on May 31, 2019. These movements were offset by an increase in accounts payable and accrued liabilities of $6.5 million due to the addition of C Technologies as well as a decrease in unbilled receivables of $2.0 million. The remaining cash provided by operating activities resulted from favorable changes in various other working capital accounts.

Investing activities

Our investing activities consumed $43.1 million of cash during the nine months ended September 30, 2020 related to the EMT Acquisition on July 13, 2020, as well as ongoing capital expenditures. Our investing activities consumed $198.2 million in the nine months ended September 30, 2019 related to the purchase of C Technologies, and capital expenditures. We consumed $28.5 million in cash (net of cash received) for the EMT Acquisition on July 13, 2020 and $182.2 million in cash (net of cash received) for the C Technologies Acquisition on May 31, 2019.

Capital expenditures in 2020 and 2019 included $3.6 million and $4.6 million, respectively, for capitalized costs related to our internal-use software.

Financing activities

Cash provided by financing activities of $7.1 million for the nine months ended September 30, 2020 included proceeds from stock option exercises and the vesting of stock units during the period. Cash provided by financing activities of $485.0 million for the nine months ended September 30, 2019 included $320.7 million from the issuance of our common stock resulting from our public offerings completed in May and June 2019. In addition, in July 2019 we issued $287.5 million aggregate principal amount of the 2019 Notes for net proceeds of $278.6 million. Proceeds from stock option exercises during the nine months ended September 30, 2019 were $1.1 million. Offsetting these movements was $115.0 million of cash utilized by us in July 2019 to settle the 2016 Notes.

Working capital increased by approximately $52.2 million to $645.7 million at September 30, 2020 from $593.5 million at December 31, 2019 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;
- the ability to sustain sales and profits of our bioprocessing products;
- our ability to acquire additional bioprocessing products;
- our identification and execution of strategic acquisitions or business combinations;
- the scope of and progress made in our R&D activities;
- the extent of any share repurchase activity; and
- the success of any proposed financing efforts.

Absent acquisitions of additional products, product candidates or intellectual property, we believe our current cash balances are adequate to meet our cash needs for at least the next 24 months from the date of this filing. We expect operating expenses for the rest of the year to increase as we continue to expand our bioprocessing business. We expect to incur continued spending related to the development and expansion of our bioprocessing product lines and expansion of 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, and continued investment in our intellectual property portfolio.

We plan to continue to invest in our bioprocessing business and in key R&D activities associated with the development of new bioprocessing products. We actively evaluate various strategic transactions on an ongoing basis, including licensing or acquiring complementary products, technologies or businesses that would complement our existing portfolio. 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. If our available cash balances and anticipated cash flow from operations are insufficient to satisfy our liquidity requirements, including because of any such acquisition-related financing needs or lower demand for our products, we may seek to sell common or preferred equity or convertible debt securities, enter into a credit facility or another form of third-party funding, or seek other debt funding. The sale of equity and convertible debt securities may result in dilution to our stockholders, and those securities may have rights senior to those of our common shares. If we raise additional funds through the issuance of preferred stock, convertible debt securities or other debt financing, these securities or other debt could contain covenants that would restrict our operations. Any other third-party funding arrangement could require us to relinquish valuable rights. We may require additional capital beyond our currently anticipated amounts. Additional capital may not be available on reasonable terms, if at all.

Off-Balance Sheet Arrangements

We do not have any special purpose entities or off-balance sheet financing arrangements as of September 30, 2020.

Net Operating Loss Carryforwards

At December 31, 2019, we had net operating loss carryforwards of $0.2 million remaining. We had business tax credits carryforwards of $2.1 million available to reduce future federal income taxes, if any. The business tax credits carryforwards will continue to expire at various dates through December 2039. Net operating loss carryforwards and available tax credits are subject to review and possible adjustment by the Internal Revenue Service, state and foreign jurisdictions and may be limited in the event of certain changes in the ownership interest of significant stockholders.

Effects of Inflation

Our assets are primarily monetary, consisting of cash, cash equivalents and marketable securities. Because of their liquidity, these assets are not directly affected by inflation. Since we intend to retain and continue to use our equipment, furniture and fixtures and leasehold improvements, we believe that the incremental inflation related to replacement costs of such items will not materially affect our operations. However, the rate of inflation affects our expenses, such as those for employee compensation and contract services, which could increase our level of expenses and the rate at which we use our resources.

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, product candidate research, development and regulatory approval, SG&A expenditures, intellectual property, development and manufacturing plans, availability of materials and product and adequacy of capital resources, our financing plans, and the projected impact of, and response to, the COVID-19 coronavirus pandemic and the related downturn of the U.S. and global economies constitute forward-looking statements. These forward-looking statements are based on current expectations, estimates, forecasts and projections about the industry and markets in which the Company operates, and management's beliefs and assumptions. The Company undertakes no obligation to publicly update or revise the statements in light of future developments. In addition, other written and oral statements that constitute forward-looking statements may be made by the Company or on the Company's behalf. Words such as "expect," "seek," "anticipate," "intend," "plan," "believe," "could," "estimate," "may," "target," "project," or variations of such words and similar expressions are intended to identify 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 following: the ultimate impact of the coronavirus pandemic on our business or financial results; the success of current and future collaborative or supply relationships, including our agreements with Cytiva (formerly GE Healthcare), MilliporeSigma and Purolite; 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 U.S. 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; the effect of the pandemic of the novel coronavirus disease, including mitigation efforts and economic effects, on our business operations and the operations of our customers and suppliers; 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 sections entitled "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2019 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2020.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Risk

We have historically held investments in commercial paper, U.S. Government and agency securities as well as corporate bonds and other debt 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. We do not have any such investments as of September 30, 2020. As a result, a hypothetical 100 basis point increase in interest rates would have no effect on our cash position as of September 30, 2020.

We generally place our marketable security investments in high quality credit instruments, as specified in our investment policy guidelines. We believe that the conservative nature of our investments mitigates our interest rate exposure, and our investment policy limits the amount of our credit exposure to any one issue, issuer (with the exception of U.S. agency obligations) and type of instrument. We do not expect any material losses from our marketable security investments and therefore believe that our potential interest rate exposure is limited.

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 krona, 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 krona, 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 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 at the reasonable assurance level.

Changes in Internal Control

We acquired Engineered Molding Technology LLC ("EMT") on July 13, 2020. The financial results of EMT are included in our unaudited consolidated financial statements as of September 30, 2020 and for the quarter then ended. As this acquisition occurred in the third quarter of 2020, the scope of our assessment of our internal control over financial reporting does not include EMT. This exclusion is in accordance with the Securities and Exchange Commission's general guidance that an assessment of a recently acquired business may be omitted from our scope in the year of acquisition.

In connection with our initiative to integrate and enhance our global information technology systems and business processes, we continued the phased implementation of a new enterprise resource planning ("ERP") system. The ERP system is being implemented in phases through 2021. The second phase was completed during the third quarter of 2020. As a result of this implementation, we modified certain existing internal controls over financial reporting as well as implemented new controls and procedures related to the new ERP system as of September 30, 2020.

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 September 30, 2020 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 Part I, Item 1A of our Annual Report on Form 10-K for the period ended December 31, 2019 and in 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 period ended December 31, 2019 and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2020.

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

None.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. EXHIBITS

(a) Exhibits

Exhibit Number	Document Description
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).
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.INS+	XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH+	Inline XBRL Taxonomy Extension Schema Document.
101.CAL+	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF+	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB+	Inline XBRL Taxonomy Extension Label Linkbase Document.
101.PRE+	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104+	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in Exhibits 101.*).

Management contract or compensatory plan or arrangement.

+ 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: November 5, 2020 By: /S/ TONY J. HUNT

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

Date: November 5, 2020 By: /S/ JON SNODGRES

Jon Snodgres
Chief Financial Officer
(Principal financial officer)
Repligen Corporation

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO RULE 13a-14(a) / RULE 15d-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

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: November 5, 2020

/s/ TONY J. HUNT

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

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO RULE 13a-14(a) / RULE 15d-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

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: November 5, 2020

/s/ JON SNODGRES

Jon Snodgres
Chief Financial Officer
(Principal financial officer)

Exhibit 32.1*

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

In connection with the Quarterly Report of Repligen Corporation (the "Company") on Form 10-Q for the period ended September 30, 2020 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: November 5, 2020 By: /S/ TONY J. HUNT

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

Date: November 5, 2020 By: /S/ JON SNODGRES

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.