HARVARD BIOSCIENCE INC
Form 10-Q
August 04, 2016

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, DC 20549

FORM 10-Q

Quarterly report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the quarterly period ended June 30, 2016

Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

For the transition period from ______ to ______

Commission file number 001-33957

HARVARD BIOSCIENCE, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**04-3306140**
(State or Other Jurisdiction of	**(IRS Employer**
Incorporation or Organization)	**Identification No.)**

84 October Hill Road, Holliston, MA	**01746**
(Address of Principal Executive Offices)	**(Zip Code)**

(508) 893-8999

(Registrant's telephone number, including area code)

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

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

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

Large accelerated filer Accelerated filer

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

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

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

As of July 29, 2016, there were 34,313,005 shares of common stock, par value $0.01 per share, outstanding.

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HARVARD BIOSCIENCE, INC.

FORM 10-Q
For the Quarter Ended June 30, 2016

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PART I. FINANCIAL INFORMATION

Item 1. Financial Statements.

HARVARD BIOSCIENCE, INC.

CONSOLIDATED BALANCE SHEETS

(Unaudited, in thousands, except share and per share data)

	June 30, 2016	December 31, 2015
Assets		
Current assets:		
Cash and cash equivalents	$3,631	$6,744
Accounts receivable, net of allowance for doubtful accounts of $363 and $310, respectively	16,347	17,547
Inventories	22,209	22,343
Deferred income tax assets - current	-	42
Other receivables and other assets	4,632	3,873
Total current assets	46,819	50,549
Property, plant and equipment, net	5,641	5,902
Deferred income tax assets - non-current	954	995
Amortizable intangible assets, net	19,617	20,872
Goodwill	39,735	40,357
Other indefinite lived intangible assets	1,225	1,223
Other assets	94	152
Total assets	$114,085	$120,050
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion, long-term debt	$2,389	$2,364
Accounts payable	6,577	8,782
Deferred revenue	913	752
Accrued income taxes	244	290
Accrued expenses	3,952	4,021
Deferred income tax liabilities - current	-	2,246
Other liabilities - current	775	868
Total current liabilities	14,850	19,323
Long-term debt, less current installments	13,774	16,369
Deferred income tax liabilities - non-current	6,070	3,775
Other long term liabilities	2,728	2,985
Total liabilities	37,422	42,452

Commitments and contingencies		
Stockholders' equity:		
Preferred stock, par value $0.01 per share, 5,000,000 shares authorized	-	-
Common stock, par value $0.01 per share, 80,000,000 shares authorized; 42,058,512 and 41,724,772 shares issued and 34,313,005 and 33,979,265 shares outstanding, respectively	417	416
Additional paid-in-capital	213,100	211,457
Accumulated deficit	(113,072)	(111,723)
Accumulated other comprehensive loss	(13,114)	(11,884)
Treasury stock at cost, 7,745,507 common shares	(10,668)	(10,668)
Total stockholders' equity	76,663	77,598
Total liabilities and stockholders' equity	$114,085	$120,050

See accompanying notes to unaudited consolidated financial statements.

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HARVARD BIOSCIENCE, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE (LOSS) INCOME

(Unaudited, in thousands, except per share data)

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Revenues	$26,136	$28,800	$53,099	$54,563
Cost of revenues (exclusive of items shown separately below)	14,461	16,205	28,479	30,490
Gross profit	11,675	12,595	24,620	24,073
Sales and marketing expenses	5,086	5,128	10,188	10,327
General and administrative expenses	5,236	4,922	11,184	9,753
Research and development expenses	1,502	1,714	2,927	3,462
Restructuring charges	1	54	12	111
Amortization of intangible assets	690	678	1,370	1,471
Total operating expenses	12,515	12,496	25,681	25,124
Operating (loss) income	(840)	99	(1,061)	(1,051)
Other income (expense):				
Foreign exchange	282	(134)	273	89
Interest expense	(180)	(215)	(344)	(437)
Interest income	-	3	1	4
Other expense, net	(29)	(180)	(79)	(796)
Other income (expense), net	73	(526)	(149)	(1,140)
Loss before income taxes	(767)	(427)	(1,210)	(2,191)
Income tax (benefit) expense	(54)	(776)	139	(1,139)
Net (loss) income	$(713)	$349	$(1,349)	$(1,052)
(Loss) earnings per share:				
Basic (loss) earnings per common share	$(0.02)	$0.01	$(0.04)	$(0.03)
Diluted (loss) earnings per common share	$(0.02)	$0.01	$(0.04)	$(0.03)
Weighted average common shares:				
Basic	34,127	33,569	34,070	33,240
Diluted	34,127	35,026	34,070	33,240
Comprehensive (loss) income:				
Net (loss) income	$(713)	$349	$(1,349)	$(1,052)

Foreign currency translation adjustments	(1,821)	1,760	(1,205)	(2,737)
Derivatives qualifying as hedges, net of tax:				
Loss on derivative instruments designated and qualifying as cash flow hedges	(12)	(12)	(48)	(71)
Amounts reclassified from accumulated other comprehensive loss to net loss	10	24	23	50
Total comprehensive (loss) income	$(2,536)	$2,121	$(2,579)	$(3,810)

See accompanying notes to unaudited consolidated financial statements.

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HARVARD BIOSCIENCE, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(Unaudited, in thousands)

	Six Months Ended June 30,	
	2016	2015
Cash flows from operating activities:		
Net loss	$(1,349)	$(1,052)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock compensation expense	1,653	1,272
Depreciation	809	769
Loss on disposal of fixed assets	-	11
Non-cash restructuring credits	-	(64)
Amortization of catalog costs	6	8
Provision for allowance for doubtful accounts	44	3
Amortization of intangible assets	1,370	1,471
Amortization of deferred financing costs	56	30
Deferred income taxes	4	(1,027)
Changes in operating assets and liabilities:		
Decrease (increase) in accounts receivable	959	(2,136)
Increase in inventories	(95)	(1,242)
Increase in other receivables and other assets	(865)	(240)
(Decrease) increase in trade accounts payable	(2,459)	2,451
Decrease in accrued income taxes	(114)	(395)
Increase (decrease) in accrued expenses	13	(660)
Increase in deferred revenue	188	216
Decrease in other liabilities	(4)	(396)
Net cash provided by (used) in operating activities	216	(981)
Cash flows used in investing activities:		
Additions to property, plant and equipment	(402)	(1,640)
Additions to catalog costs	(10)	-
Proceeds from sales of property, plant and equipment	-	15
Acquisitions, net of cash acquired	-	(4,545)
Net cash used in investing activities	(412)	(6,170)
Cash flows provided by (used in) financing activities:		
Proceeds from issuance of debt	2,000	4,050
Repayments of debt	(4,625)	(4,850)
Payments of debt issuance costs	-	(32)
Net (taxes paid for) proceeds from issuance of common stock	(9)	1,864
Net cash (used in) provided by financing activities	(2,634)	1,032
Effect of exchange rate changes on cash	(283)	(613)

Decrease in cash and cash equivalents	(3,113)	(6,732)
Cash and cash equivalents at the beginning of period	6,744	14,134
Cash and cash equivalents at the end of period	$3,631	$7,402
Supplemental disclosures of cash flow information:		
Cash paid for interest	$312	$427
Cash paid for income taxes, net of refunds	$452	$312

See accompanying notes to unaudited consolidated financial statements.

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HARVARD BIOSCIENCE, INC.

NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS

1. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation

The unaudited consolidated financial statements of Harvard Bioscience, Inc. and its wholly-owned subsidiaries (collectively, "Harvard Bioscience" or the "Company") as of June 30, 2016 and for the three and six months ended June 30, 2016 and 2015 have been prepared by the Company pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"). Certain information and footnote disclosures normally included in financial statements prepared in accordance with U.S. generally accepted accounting principles ("U.S. GAAP") have been condensed or omitted pursuant to such rules and regulations. The December 31, 2015 consolidated balance sheet was derived from audited financial statements, but does not include all disclosures required by U.S. GAAP. However, the Company believes that the disclosures are adequate to make the information presented not misleading. These unaudited consolidated financial statements should be read in conjunction with the consolidated financial statements and the notes thereto included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2015, which was filed with the SEC on April 29, 2016.

In the opinion of management, all adjustments, which include normal recurring adjustments necessary to present a fair statement of financial position as of June 30, 2016, results of operations and comprehensive loss for the three and six months ended June 30, 2016 and 2015 and cash flows for the six months ended June 30, 2016 and 2015, as applicable, have been made. The results of operations for the three and six months ended June 30, 2016 are not necessarily indicative of the operating results for the full fiscal year or any future periods.

Summary of Significant Accounting Policies

The accounting policies underlying the accompanying unaudited consolidated financial statements are those set forth in Note 2 to the consolidated financial statements included in the Company's Annual Report on Form 10-K for the year ended December 31, 2015, which was filed with the SEC on April 29, 2016.

2. Recently Issued Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2014-09, *"Revenue from Contracts with Customers,"* a new accounting standard that provides for a comprehensive model to use in the accounting for revenue arising from contracts with customers that will replace most existing revenue recognition guidance within generally accepted accounting principles in the United States. Under this standard, revenue will be recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. At its July 2015 meeting, the FASB agreed to defer the mandatory effective date of ASU 2014-09 one year. Under the one year deferral, the standard will take effect in 2018 for calendar year-end public entities. The Company is assessing the new standard and has not yet determined the impact to the consolidated financial statements.

In July 2015, the FASB issued ASU 2015-11, *Simplifying Measurement of Inventory*. The update requires measurement of most inventory "at the lower of cost and net realizable value", and applies to all entities that recognize inventory within the scope of ASC 330, except for inventory measured under the last-in, first-out (LIFO) method or the retail inventory method (RIM). ASU 2015-11 requires prospective application and represents a change in accounting principle. The update is effective for fiscal years beginning after December 15, 2016. Early adoption is permitted for financial statements that have not been previously issued. The Company is evaluating the impact of ASU 2015-11 on its consolidated financial statements and the possibility of early adoption by the Company.

In February 2016, the FASB issued ASU 2016-02, *Leases*, which is intended to improve financial reporting about leasing transactions. The update requires a lessee to record on the balance sheet the assets and liabilities for the rights and obligations created by lease terms of more than 12 months. The update is effective for fiscal years beginning after December 15, 2018. The Company is evaluating the impact of ASU 2016-02 on its consolidated financial statements.

In March 2016, the FASB issued ASU 2016-09, *Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*, which simplifies the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities and classification on the statement of cash flows. The update is effective for fiscal years beginning after December 15, 2016 and early adoption is permitted. The Company is evaluating the impact of ASU 2016-09 on its consolidated financial statements.

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In June 2016, the FASB issued ASU 2016-13, *Financial Instruments – Credit Losses (Topic 326), Measurement of credit losses on Financial Instruments.* The update amends the FASB's guidance on the impairment of financial instruments. The ASU adds to U.S. GAAP an impairment model (known as the current expected credit loss (CECL) model) that is based on expected losses rather than incurred losses. Under the new guidance, an entity recognizes as an allowance its estimate of expected credit losses, which the FASB believes will result in more timely recognition of such losses. The ASU is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. The Company is evaluating the impact of ASU 2016-13 on its consolidated financial statements.

Recently Adopted Accounting Pronouncements

In April 2015, the FASB issued ASU 2015-03, *Interest - Imputation of Interest - Simplifying the Presentation of Debt Issuance Costs*. Under this guidance, debt issuance costs related to a recognized debt liability should be presented in the balance sheet as a direct deduction from the carrying amount of that debt liability. The provisions of this guidance are to be applied retrospectively and are effective for interim and annual periods beginning after December 15, 2015. The Company adopted this guidance during the six months ended June 30, 2016. The consolidated balance sheet as of December 31, 2015, included in these consolidated financial statements, reflects a restatement to reclassify unamortized deferred financing costs of approximately $0.2 million from other long-term assets to long-term debt. For deferred financing costs paid to secure long-term debt, the Company made a policy election to present such costs as a direct deduction from the debt liability on the consolidated balance sheet.

In September 2015, the FASB issued ASU 2015-16, *Simplifying the Accounting for Measurement-Period Adjustments*. The update eliminates the requirement to retrospectively adjust financial statements for measurement-period adjustments that occur in periods after a business combination. Under the update, measurement-period adjustments are to be calculated as if they were known at the acquisition date, but are recognized in the reporting period in which they are determined. Additional disclosures are required about the impact on current-period earnings. ASU 2015-16 requires prospective application to adjustments of provisional amounts that occur after the effective date. The update was effective for fiscal years beginning after December 15, 2015. The Company adopted ASU 2015-16 on January 1, 2016. The adoption of ASU 2015-16 did not have a material impact on its consolidated financial statements.

In November 2015, the FASB issued ASU 2015-17, *Balance Sheet Classification of Deferred Taxes*. The update requires all deferred income taxes to be presented on the balance sheet as noncurrent. The new guidance is intended to simplify financial reporting by eliminating the requirement to classify deferred taxes between current and noncurrent. The update is effective for fiscal years beginning after December 15, 2016. Early adoption is permitted at the beginning of an interim or annual period. During the six months ended June 30, 2016, the Company early adopted the new guidance on a prospective basis and has presented all deferred tax assets and deferred tax liabilities as noncurrent in the consolidated balance sheet at June 30, 2016. Prior periods presented in the consolidated financial statements were not retrospectively adjusted.

3. Accumulated Other Comprehensive Loss

Changes in each component of accumulated other comprehensive loss, net of tax are as follows:

(in thousands)	Foreign currency translation adjustments	Derivatives qualifying as hedges	Defined benefit pension plans	Total
Balance at December 31, 2015	$ (9,594)	$ (10)	$ (2,280)	$ (11,884)
Other comprehensive loss before reclassifications	(1,205)	(48)	-	(1,253)
Amounts reclassified from AOCI	-	23	-	23
Other comprehensive loss	(1,205)	(25)	-	(1,230)
Balance at June 30, 2016	$ (10,799)	$ (35)	$ (2,280)	$ (13,114)

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4. Acquisitions

The Company completed one acquisition during the six months ended June 30, 2015.

HEKA Elektronik

On January 8, 2015, the Company, through its wholly-owned Ealing Scientific Limited and Multi Channel Systems MCS GmbH (“MCS”) subsidiaries, acquired all of the issued and outstanding shares of HEKA Elektronik (“HEKA”) for approximately $5.9 million, or $4.5 million, net of cash acquired. Included in the acquisition of HEKA were: HEKA Electronik Dr. Schulze GmbH, based in Lambrecht, Germany (“HEKA Germany”); HEKA Electronics Incorporated, based in Chester, Nova Scotia, Canada (“HEKA Canada”); and HEKA Instruments Incorporated, based in Bellmore, New York. The Company funded the acquisition from its existing cash balances.

HEKA is a developer, manufacturer and marketer of sophisticated electrophysiology instrumentation and software for biomedical and industrial research applications. This acquisition is complementary to the electrophysiology line currently offered by the Company’s wholly-owned Warner Instruments and MCS subsidiaries.

The aggregate purchase price for this acquisition was allocated to tangible and intangible assets acquired as follows:

	(in thousands)
Tangible assets	$ 4,165
Liabilities assumed	(2,426)
Net assets	1,739
Goodwill and intangible assets:	
Goodwill	1,668
Trade name	774
Customer relationships	1,627
Developed technology	1,338
Non-compete agreements	27
Deferred tax liabilities	(1,245)
Total goodwill and intangible assets, net of tax	4,189
Acquisition purchase price	$ 5,928

Goodwill recorded as a result of the acquisition of HEKA is not deductible for tax purposes.

At June 30, 2016, an immaterial correction was made to the allocation of the aggregate purchase price to the tangible and intangible assets acquired to increase both accrued liabilities and goodwill by $50,000 as of June 30, 2016. This correction has been reflected in the table above.

The results of operations for HEKA have been included in the Company's consolidated financial statements from the date of acquisition.

Direct acquisition costs recorded in other expense, net in the Company's consolidated statements of operations were immaterial for both the three and six months ended June 30, 2016, respectively. Direct acquisition costs recorded in other expense, net in the Company's consolidated statements of operations were $0.2 million and $0.8 million for the three and six months ended June 30, 2015, respectively.

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5. Goodwill and Other Intangible Assets

Intangible assets consist of the following:

	June 30, 2016 (in thousands)		December 31, 2015		Weighted Average Life (a)	
Amortizable intangible assets:	Gross	Accumulated Amortization	Gross	Accumulated Amortization		
Existing technology	$15,731	$(11,807)	$16,022	$(11,686)	7.2	Years
Trade names	7,666	(3,336)	7,636	(3,076)	8.5	Years
Distribution agreements/customer relationships	23,756	(12,506)	23,676	(11,849)	9.5	Years
Patents	222	(109)	245	(96)	2.7	Years
Total amortizable intangible assets	47,375	$(27,758)	47,579	$(26,707)		
Indefinite-lived intangible assets:						
Goodwill	39,735		40,357			
Other indefinite-lived intangible assets	1,225		1,223			
Total goodwill and other indefinite-lived intangible assets	40,960		41,580			
Total intangible assets, gross	$88,335		$89,159			

(a) Weighted average life as of June 30, 2016.

The change in the carrying amount of goodwill for the six months ended June 30, 2016 is as follows:

	(in thousands)
Balance at December 31, 2015	40,357
Adjustment to purchase price allocation of prior year acquisition	50
Effect of change in currency translation	(672)
Balance at June 30, 2016	$ 39,735

Intangible asset amortization expense was $0.7 million for both the three months ended June 30, 2016 and 2015. Intangible asset amortization expense was $1.4 million and $1.5 million for the six months ended June 30, 2016 and 2015, respectively. Amortization expense of existing amortizable intangible assets is currently estimated to be $2.7 million for the year ending December 31, 2016, $2.5 million for the year ending December 31, 2017, $2.3 million for the year ending December 31, 2018, $2.2 million for the year ending December 31, 2019 and $2.2 million

for the year ending December 31, 2020.

6. Inventories

Inventories consist of the following:

	June 30, 2016	December 31, 2015
	(in thousands)	
Finished goods	$ 10,093	$ 10,957
Work in process	1,084	888
Raw materials	11,032	10,498
Total	$ 22,209	$ 22,343

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7. Property, Plant and Equipment

Property, plant and equipment consist of the following:

	June 30, 2016	December 31, 2015
	(in thousands)	
Land, buildings and leasehold improvements	$2,609	$2,825
Machinery and equipment	10,523	10,131
Computer equipment and software	7,482	7,503
Furniture and fixtures	1,339	1,358
Automobiles	115	103
	22,068	21,920
Less: accumulated depreciation	(16,427)	(16,018)
Property, plant and equipment, net	$5,641	$5,902

8. Restructuring and Other Exit Costs

Q4 2015 Restructuring Plan

The Company committed to a restructuring plan on October 27, 2015, which included eliminating certain positions made redundant as a result of its site consolidations, as well as a realignment of its commercial sales team. Payments related to this plan were made through the second quarter of 2016. Activity and liability balances related to these charges were as follows:

	Severance Costs (in thousands)
Restructuring balance at December 31, 2015	$ 90
Cash payments	(90)
Restructuring balance at June 30, 2016	$ -

Q2 2015 Restructuring Plan

During the second quarter of 2015, management of the Company initiated a plan to consolidate the manufacturing operations of HEKA Canada to HEKA Germany in order to create organizational efficiencies. No further charges are expected to be incurred on this matter. At June 30, 2016, the Company has no remaining liability related to this plan on its balance sheet. Activity and liability balances related to these charges were as follows:

	Severance Costs (in thousands)
Restructuring charges	$ 13
Cash payments	-
Restructuring balance at June 30, 2015	$ 13

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Q1 2015 Restructuring Plan

During the first quarter of 2015, the Company’s management initiated a plan to relocate certain manufacturing operations in order to create organizational efficiencies and reduce operating expenses. The Q1 2015 restructuring plan included plans to consolidate the manufacturing operations of its Coulbourn subsidiary to its headquarters in Holliston, MA. Payments related to this plan are expected to be made through the third quarter of 2016. For the six months ended June 30, 2016, activity and liability balances related to these charges were as follows:

	Severance Costs	Other	Total
	(in thousands)		
Restructuring balance at December 31, 2015	$11	$ -	$11
Restructuring charges	-	4	4
Cash payments	(8)	(4)	(12)
Restructuring balance at June 30, 2016	$3	$ -	$3

For the six months ended June 30, 2015, activity and liability balances related to these charges were as follows:

	Severance Costs (in thousands)
Restructuring charges	88
Non-cash reversal of restructuring charges	(6)
Cash payments	-
Restructuring balance at June 30, 2015	$ 82

2014 Restructuring Plan

During the fourth quarter of 2014, the Company’s management initiated a plan to relocate certain distribution and manufacturing operations in order to create organizational efficiencies and reduce operating expenses. The 2014 restructuring plan included plans to relocate the distribution operations of the Company’s Denville Scientific subsidiary from New Jersey to North Carolina, as well as consolidating the manufacturing operations of its Biochrom subsidiary to its headquarters in Holliston, MA. Payments related to this plan are expected to be made through the third quarter of 2016. For the six months ended June 30, 2016, activity and liability balances related to these charges were as follows:

	Severance Costs	Other	Total
	(in thousands)		
Restructuring balance at December 31, 2015	$31	$ -	$31
Restructuring charges	-	8	8
Cash payments	-	(8)	(8)
Effect of change in currency translation	(3)	-	(3)
Restructuring balance at June 30, 2016	$28	$ -	$28

For the six months ended June 30, 2015, activity and liability balances related to these charges were as follows:

	Severance Costs	Other	Total
	(in thousands)		
Restructuring balance at December 31, 2014	$626	$-	$626
Restructuring charges	39	35	74
Non-cash reversal of restructuring charges	(58)	-	(58)
Cash payments	(129)	(35)	(164)
Effect of change in currency translation	3	-	3
Restructuring balance at June 30, 2015	$481	$-	$481

Aggregate net restructuring charges for the three and six months ended June 30, 2016 and 2015 were as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2016	2015	2016	2015
	(in thousands)			
Restructuring charges	$1	54	$12	$111

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9. Related Party Transactions

As part of the acquisitions of MCS and Triangle BioSystems, Inc. ("TBSI") in 2014, as well as HEKA in 2015, the Company signed lease agreements with the former owners of the acquired companies. The principals of such former owners of MCS, TBSI and HEKA were employees of the Company as of June 30, 2015, while the principals of such former owners of MCS and TBSI were employees of the Company as of June 30, 2016. Pursuant to a lease agreement, the Company incurred rent expense of approximately $58,000 and $10,000 to the former owners of MCS and TBSI, respectively, for the three months ended June 30, 2016. The Company incurred rent expense of approximately $113,000 and $21,000 to the former owners of MCS and TBSI, respectively, for both the six months ended June 30, 2016 and June 30, 2015. The Company incurred rent expense of approximately $81,000 to the former owners of HEKA for the six months ended June 30, 2015. Pursuant to a lease agreement, the Company incurred rent expense of approximately $58,000, $11,000 and $42,000 to the former owners of MCS, TBSI and HEKA, respectively, for the three months ended June 30, 2015.

10. Warranties

Warranties are estimated and accrued at the time revenues are recorded. A rollforward of the Company's product warranty accrual is as follows:

	Beginning Balance	Payments	Additions/ (Credits)	Ending Balance
	(in thousands)			
Year ended December 31, 2015	$252	(81)	(24)	$ 147
Six months ended June 30, 2016	$147	(41)	87	$ 193

11. Employee Benefit Plans

Certain of the Company's subsidiaries in the United Kingdom, or UK, Harvard Apparatus Limited and Biochrom Limited, maintain contributory, defined benefit or defined contribution pension plans for substantially all of their employees. These defined benefit pension plans are closed to new employees, as well as closed to the future accrual of benefits for existing employees. The components of the Company's defined benefit pension expense were as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2016	2015	2016	2015
	(in thousands)			

Components of net periodic benefit cost:				
Interest cost	$168	$190	336	367
Expected return on plan assets	(181)	(179)	(362)	(345)
Net amortization loss	79	81	159	156
Net periodic benefit cost	$66	$92	$133	$178

For the three months ended June 30, 2016 and 2015, the Company contributed $0.2 million, for both periods, to its defined benefit pension plans. For the six months ended June 30, 2016 and 2015, the Company contributed $0.4 million, for both periods, to its defined benefit pension plans. The Company expects to contribute approximately $0.4 million to its defined benefit pension plans during the remainder of 2016.

The Company had an underfunded pension liability of approximately $2.6 million and $2.8 million, as of June 30, 2016 and December 31, 2015, respectively, included in the other long term liabilities line item in the consolidated balance sheets.

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12. Leases

The Company has noncancelable operating leases for office and warehouse space expiring at various dates through 2021 and thereafter. Rent expense, which is recorded on a straight-line basis, is estimated to be $1.9 million for the year ended December 31, 2016. Rent expense was approximately $0.5 million and $0.4 million for the three months ended June 30, 2016 and 2015, respectively. Rent expense was approximately $1.0 million and $0.8 million for the six months ended June 30, 2016 and 2015, respectively.

Future minimum lease payments for operating leases, with initial or remaining terms in excess of one year at June 30, 2016, are as follows:

	Operating Leases (in thousands)
2017	$ 1,711
2018	1,707
2019	1,600
2020	1,422
2021	1,210
Thereafter	3,552
Net minimum lease payments	$ 11,202

13. Capital Stock

Common Stock

On February 5, 2008, the Company’s Board of Directors adopted a Shareholder Rights Plan and declared a dividend distribution of one preferred stock purchase right for each outstanding share of the Company’s common stock to shareholders of record as of the close of business on February 6, 2008. Initially, these rights will not be exercisable and will trade with the shares of the Company’s common stock. Under the Shareholder Rights Plan, the rights generally will become exercisable if a person becomes an “acquiring person” by acquiring 20% or more of the common stock of the Company or if a person commences a tender offer that could result in that person owning 20% or more of the common stock of the Company. If a person becomes an acquiring person, each holder of a right (other than the acquiring person) would be entitled to purchase, at the then-current exercise price, such number of shares of preferred stock which are equivalent to shares of the Company’s common stock having a value of twice the exercise price of the right. If the Company is acquired in a merger or other business combination transaction after any such event, each holder of a right would then be entitled to purchase, at the then-current exercise price, shares of the acquiring company’s common stock having a value of twice the exercise price of the right.

Preferred Stock

The Company's Board of Directors has the authority to issue up to 5.0 million shares of preferred stock and to determine the price privileges and other terms of the shares. The Board of Directors may exercise this authority without any further approval of stockholders. As of June 30, 2016, the Company had no preferred stock issued or outstanding.

Employee Stock Purchase Plan (as amended, the "ESPP")

In 2000, the Company approved the ESPP. Under this ESPP, participating employees can authorize the Company to withhold a portion of their base pay during consecutive six-month payment periods for the purchase of shares of the Company's common stock. At the conclusion of the period, participating employees can purchase shares of the Company's common stock at 85% of the lower of the fair market value of the Company's common stock at the beginning or end of the period. Shares are issued under the ESPP for the six-month periods ending June 30 and December 31. Under this plan, 750,000 shares of common stock are authorized for issuance of which 683,364 shares were issued as of June 30, 2016. During the three months ended June 30, 2016 and 2015, the Company issued 39,353 shares and 26,181 shares, respectively, of the Company's common stock under the ESPP.

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Stock Option and Equity Incentive Plans

Third Amended and Restated 2000 Stock Option and Incentive Plan (as amended, the "Third A&R Plan")

The Second Amendment to the Third A&R Plan (the "Amendment") was adopted by the Board of Directors on April 3, 2015. Such Amendment was approved by the stockholders at the Company's 2015 Annual Meeting of Stockholders. Pursuant to the Amendment, the aggregate number of shares authorized for issuance under the Third A&R Plan was increased by 2,500,000 shares to 17,508,929.

Restricted Stock Units with a Market Condition (the "Market Condition RSU's")

On August 3, 2015, the Compensation Committee of the Board of Directors of the Company approved and granted deferred stock awards of Market Condition RSU's to members of the Company's management team under the Third A&R Plan. The vesting of these Market Condition RSU's is cliff-based and linked to the achievement of a relative total shareholder return of the Company's common stock from August 3, 2015 to the earlier of (i) August 3, 2018 or (ii) upon a change of control (measured relative to the Russell 3000 index and based on the 20-day trading average price before each such date). As of June 30, 2016, the target number of these restricted stock units that may be earned is 182,150 shares; the maximum amount is 150% of the target number.

Stock-Based Payment Awards

The Company accounts for stock-based payment awards in accordance with the provisions of FASB ASC 718, which requires it to recognize compensation expense for all stock-based payment awards made to employees and directors including stock options, restricted stock units, Market Condition RSU's and employee stock purchases related to the ESPP.

Stock option and restricted stock unit activity under the Company's Third A&R Plan for the six months ended June 30, 2016 was as follows:

	Stock Options		Restricted Stock Units		Market Condition RSU's	
		Weighted				
	Stock	Average	Restricted		Market	
	Options	Exercise	Stock Units	Grant Date		Grant Date

	Outstanding	Price	Outstanding	Fair Value	Condition RSU's Outstanding	Fair Value
Balance at December 31, 2015	5,022,186	$ 3.85	313,559	$ 5.29	185,538	$ 4.81
Granted	28,000	3.24	941,190	2.93	-	-
Exercised	(338,532)	2.83	-	-	-	-
Vested (RSUs)	-	-	(251,320)	-	-	-
Cancelled / forfeited	(369,270)	3.79	(25,636)	4.07	(3,388)	4.81
Balance at June 30, 2016	4,342,384	$ 3.93	977,793	$ 3.20	182,150	$ 4.81

The weighted average fair value of the options granted under the Third A&R Plan during the three months ended June 30, 2016 and 2015 was $1.48 and $2.08, respectively. The weighted average fair value of the options granted under the Third A&R Plan during the six months ended June 30, 2016 and 2015 was $1.26 and $2.21, respectively. The following assumptions were used to estimate the fair value, using the Black-Scholes option pricing model, of stock options granted during the three and six months ended June 30, 2016 and 2015:

	Three Months Ended June 30,		**Six Months Ended June 30,**	
	2016	**2015**	**2016**	**2015**
Volatility	42.91 %	39.35 %	41.39 %	41.08 %
Risk-free interest rate	1.40 %	1.70 %	1.45 %	1.72 %
Expected holding period (in years)	5.16 years	5.28 years	5.27 years	5.52 years
Dividend yield	- %	- %	- %	- %

The Company used historical volatility to calculate the expected volatility for each grant as of the grant date. Historical volatility was determined by calculating the mean reversion of the daily adjusted closing stock price. The risk-free interest rate assumption is based upon observed U.S. Treasury bill interest rates (risk-free) appropriate for the term of the Company’s stock options and Market Condition RSU’s. The expected holding period of stock options represents the period of time options are expected to be outstanding and is based on historical experience. The vesting period ranges from one to four years and the contractual life is ten years. The correlation coefficient, used to value the Market Condition RSU’s, represents the way in which entities move in relation to the Russell 3000 index as a whole.

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Stock-based compensation expense related to stock options, restricted stock units, Market Condition RSU's and the ESPP for the three and six months ended June 30, 2016 and 2015 was allocated as follows:

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
	(in thousands)			
Cost of revenues	$16	$15	$27	$36
Sales and marketing	141	107	242	194
General and administrative	713	548	1,335	997
Research and development	29	22	49	45
Total stock-based compensation	$899	$692	$1,653	$1,272

The Company did not capitalize any stock-based compensation.

Earnings per share

Basic earnings per share is based upon net income divided by the number of weighted average common shares outstanding during the period. The calculation of diluted earnings per share assumes conversion of stock options, restricted stock units and Market Condition RSU's into common stock using the treasury method. The weighted average number of shares used to compute basic and diluted earnings per share consists of the following:

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Basic	34,127,131	33,569,180	34,070,241	33,240,467
Effect of assumed conversion of employee and director stock options, restricted stock units and Market Condition RSU's	-	1,456,470	-	-
Diluted	34,127,131	35,025,650	34,070,241	33,240,467

Excluded from the shares used in calculating the diluted earnings per common share in the above table are options, restricted stock units and Market Condition RSU's of approximately 5,502,327 and 1,264,875 shares of common stock for the three months ended June 30, 2016 and 2015, respectively, as the impact of these shares would be anti-dilutive. Excluded from the shares used in calculating the diluted earnings per common share in the above table are options, restricted stock units and Market Condition RSU's of approximately 5,502,327 and 5,169,376 shares of common stock

for the six months ended June 30, 2016 and 2015, respectively, as the impact of these shares would be anti-dilutive.

14. Long Term Debt

On August 7, 2009, the Company entered into an Amended and Restated Revolving Credit Loan Agreement related to a $20.0 million revolving credit facility with Bank of America, as agent, and Bank of America and Brown Brothers Harriman & Co as lenders (as amended, the “2009 Credit Agreement”). On September 30, 2011, the Company entered into the First Amendment to the Amended and Restated Revolving Credit Loan Agreement (the “First Amendment”) with Bank of America as agent, and Bank of America and Brown Brothers Harriman & Co as lenders. The First Amendment extended the maturity date of the credit facility to August 7, 2013 and reduced the interest rate to the London Interbank Offered Rate plus 3.0%. On October 4, 2012, the Company entered into the Second Amendment to the Amended and Restated Revolving Credit Loan Agreement (the “Second Amendment”) with Bank of America as agent, and Bank of America and Brown Brothers Harriman & Co as lenders. The Second Amendment extended the maturity date of the credit facility to August 7, 2014.

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On March 29, 2013, the Company entered into a Second Amended and Restated Revolving Credit Agreement (as amended, the “Credit Agreement”) with Bank of America, as agent, and Bank of America and Brown Brothers Harriman & Co as lenders, that amended and restated the 2009 Credit Agreement. The Credit Agreement converted the Company’s existing outstanding revolving advances into a term loan in the principal amount of $15.0 million (the “Term Loan”), provides a revolving credit facility in the maximum principal amount of $25.0 million (“Revolving Line”) and provides a delayed draw term loan of up to $15.0 million (the “DDTL”) to fund capital contributions to the Company’s former subsidiary, Biostage. The maximum amount available under the Credit Agreement is $50.0 million as borrowings against the DDTL in excess of $10.0 million results in a dollar for dollar reduction in the Revolving Line capacity. The Revolving Line, Term Loan and DDTL each have a maturity date of March 29, 2018 (the maturity date of the Revolving Line was extended from March 29, 2016 in connection with the Third Amendment discussed below).

On October 31, 2013, the Company amended the Credit Agreement to reduce the DDTL from up to $15.0 million to up to $10.0 million and allow for an additional $5.0 million to be available for drawing as advances under the Revolving Line.

On April 24, 2015, the Company entered into the Third Amendment to the Second Amended and Restated Credit Agreement (the “Third Amendment”). The Third Amendment extended the maturity date of the Revolving Line to March 29, 2018 and reduced the interest rates on the Revolving Line, Term Loan and DDTL. Borrowings under the Term Loan and the DDTL accrued interest at a rate based on either the effective London Interbank Offered Rate (LIBOR) for certain interest periods selected by the Company, or a daily floating rate based on the British Bankers’ Association (BBA) LIBOR as published by Reuters (or other commercially available source providing quotations of BBA LIBOR), plus in either case, a margin of 2.75%. Additionally, the Revolving Line accrued interest at a rate based on either the effective LIBOR for certain interest periods selected by the Company, or a daily floating rate based on the BBA LIBOR, plus in either case, a margin of 2.25%. The Company was required to fix the rate of interest on at least 50% of the Term Loan and the DDTL through the purchase of interest rate swaps. The Term Loan and DDTL each have interest payments due at the end of the applicable LIBOR period, or monthly with respect to BBA LIBOR borrowings, and principal payments due quarterly. The Revolving Line has interest payments due at the end of the applicable LIBOR period, or monthly with respect to BBA LIBOR borrowings.

On June 30, 2015, the Company entered into the Fourth Amendment to the Second Amended and Restated Credit Agreement, which amended the Company’s quarterly minimum fixed charge coverage financial covenant.

On November 5, 2015, the Company entered into the Fifth Amendment to the Second Amended and Restated Credit Agreement, which eliminated the Company’s 2015 fourth quarter minimum fixed charge coverage financial covenant requirement. As part of the agreement, the maximum principal amount on the Revolving Line was reduced to $10.0 million until June 30, 2016. As of June 30, 2016, the maximum principal amount was restored to $25.0 million, based on the Company remaining in compliance with all covenants.

On March 9, 2016, the Company entered into the Sixth Amendment to the Second Amended and Restated Credit Agreement, which amended the principal payment amortization of the Term Loan and DDTL to five years, as well as amended the Company's quarterly minimum fixed charge coverage financial covenant.

The loans evidenced by the Credit Agreement, or the Loans, are guaranteed by all of the Company's direct and indirect domestic subsidiaries, and secured by substantially all of the assets of the Company and the guarantors. The Loans are subject to restrictive covenants under the Credit Agreement, and financial covenants that require the Company and its subsidiaries to maintain certain financial ratios on a consolidated basis, including a maximum leverage, minimum fixed charge coverage and minimum working capital. Prepayment of the Loans is allowed by the Credit Agreement at any time during the terms of the Loans. The Loans also contain limitations on the Company's ability to incur additional indebtedness and requires lender approval for acquisitions funded with cash, promissory notes and/or other consideration in excess of $6.0 million and for acquisitions funded solely with equity in excess of $10.0 million.

In April 2015, the FASB issued Accounting Standards Update No. 2015-03, *Interest - Imputation of Interest - Simplifying the Presentation of Debt Issuance Costs*. Under this guidance, debt issuance costs related to a recognized debt liability should be presented in the balance sheet as a direct deduction from the carrying amount of that debt liability. The provisions of this guidance are to be applied retrospectively and are effective for interim and annual periods beginning after December 15, 2015. The Company adopted this guidance during the six months ended June 30, 2016. The consolidated balance sheet as of December 31, 2015, included in these consolidated financial statements, reflects a restatement to reclassify unamortized deferred financing costs of approximately $0.2 million from other long-term assets to long-term debt. For deferred financing costs paid to secure long-term debt, the Company made a policy election to present such costs as a direct deduction from the debt liability on the consolidated balance sheet.

As of June 30, 2016 and December 31, 2015, the Company had net borrowings of $16.2 million and $18.7 million, respectively, outstanding under its Credit Agreement. As of June 30, 2016, the Company was in compliance with all financial covenants contained in the Credit Agreement, was subject to covenant and working capital borrowing restrictions and had available borrowing capacity under its Credit Agreement of $6.3 million.

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As of June 30, 2016, the weighted effective interest rates, net of the impact of the Company's interest rate swaps, on its Term Loan, DDTL and Revolving Line borrowings were 3.96%, 3.57% and 2.71%, respectively.

As of June 30, 2016 and December 31, 2015, the Company's borrowings were comprised of:

	June 30, 2016	December 31, 2015
	(in thousands)	
Long-term debt:		
Term loan	$6,075	$6,750
DDTL	4,950	5,500
Revolving line	5,250	6,650
Total unamortized deferred financing costs	(112)	(167)
Total debt	16,163	18,733
Less: current installments	(2,450)	(2,450)
Current unamortized deferred financing costs	61	86
Long-term debt	$13,774	$16,369

15. Derivatives

The Company uses interest-rate-related derivative instruments to manage its exposure related to changes in interest rates on its variable-rate debt instruments. The Company does not enter into derivative instruments for any purpose other than cash flow hedging. The Company does not speculate using derivative instruments.

By using derivative financial instruments to hedge exposures to changes in interest rates, the Company exposes itself to credit risk and market risk. Credit risk is the failure of the counterparty to perform under the terms of the derivative contract. When the fair value of a derivative contract is positive, the counterparty owes the Company, which creates credit risk for the Company. When the fair value of a derivative contract is negative, the Company owes the counterparty and, therefore, the Company is not exposed to the counterparty's credit risk in those circumstances. The Company minimizes counterparty credit risk in derivative instruments by entering into transactions with carefully selected major financial institutions based upon their credit profile.

Market risk is the adverse effect on the value of a derivative instrument that results from a change in interest rates. The market risk associated with interest-rate contracts is managed by establishing and monitoring parameters that limit the types and degree of market risk that may be undertaken.

The Company assesses interest rate risk by continually identifying and monitoring changes in interest rate exposures that may adversely impact expected future cash flows and by evaluating hedging opportunities. The Company maintains risk management control systems to monitor interest rate risk attributable to both the Company's outstanding or forecasted debt obligations as well as the Company's offsetting hedge positions. The risk management control systems involve the use of analytical techniques, including cash flow sensitivity analysis, to estimate the expected impact of changes in interest rates on the Company's future cash flows.

The Company uses variable-rate London Interbank Offered Rate (LIBOR) debt to finance its operations. The debt obligations expose the Company to variability in interest payments due to changes in interest rates. Management believes that it is prudent to limit the variability of a portion of its interest payments. To meet this objective, management enters into LIBOR based interest rate swap agreements to manage fluctuations in cash flows resulting from changes in the benchmark interest rate of LIBOR. These swaps change the variable-rate cash flow exposure on the debt obligations to fixed cash flows. Under the terms of the interest rate swaps, the Company receives LIBOR based variable interest rate payments and makes fixed interest rate payments, thereby creating the equivalent of fixed-rate debt for the notional amount of its debt hedged. In accordance with its Credit Agreement, the Company was required to fix the rate of interest on at least 50% of its Term Loan and the DDTL through the purchase of interest rate swaps. On June 5, 2013, the Company entered into an interest rate swap contract with an original notional amount of $15.0 million and a maturity date of March 29, 2018 in order to hedge the risk of changes in the effective benchmark interest rate (LIBOR) associated with the Company's Term Loan. On November 29, 2013, the Company entered into a second interest rate swap contract with an original notional amount of $5.0 million and a maturity date of March 29, 2018 in order to hedge the risk of changes in the effective benchmark interest rate (LIBOR) associated with the DDTL. The notional amount of the Company's derivative instruments as of June 30, 2016 was $7.5 million. The Term Loan swap contract effectively converted specific variable-rate debt into fixed-rate debt and fixed the LIBOR rate associated with the Term Loan at 0.96% plus a bank margin of 3.0%. The DDTL swap contract effectively converted specific variable-rate debt into fixed-rate debt and fixed the LIBOR rate associated with the Term Loan at 0.93% plus a bank margin of 3.0%.The interest rate swaps were designated as cash flow hedges in accordance with ASC 815, *Derivatives and Hedging*.

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The following table presents the notional amount and fair value of the Company's derivative instruments as of June 30, 2016 and December 31, 2015.

		June 30, 2016 Notional Amount	**June 30, 2016 Fair Value (a)**
Derivatives designated as hedging instruments under ASC 815	**Balance sheet classification**	(in thousands)	
Interest rate swaps	Other liabilities-non current	$7,500	$(35)

		December 31, 2015 Notional Amount	**December 31, 2015 Fair Value (a)**
Derivatives designated as hedging instruments under ASC 815	**Balance sheet classification**	(in thousands)	
Interest rate swaps	Other liabilities-non current	$9,500	$(10)

(a) See Note 16 for the fair value measurements related to these financial instruments.

All of the Company's derivative instruments are designated as hedging instruments.

The Company has structured its interest rate swap agreements to be 100% effective and as a result, there was no impact to earnings resulting from hedge ineffectiveness. Changes in the fair value of interest rate swaps designated as hedging instruments that effectively offset the variability of cash flows associated with variable-rate, long-term debt obligations are reported in accumulated other comprehensive income ("AOCI"). These amounts subsequently are reclassified into interest expense as a yield adjustment of the hedged interest payments in the same period in which the related interest affects earnings. The Company's interest rate swap agreement was deemed to be fully effective in accordance with ASC 815, and, as such, unrealized gains and losses related to these derivatives were recorded as AOCI.

The following table summarizes the effect of derivatives designated as cash flow hedging instruments and their classification within comprehensive loss for the three and six months ended June 30, 2016 and 2015:

Derivatives in Hedging Relationships	Amount of loss recognized in OCI on derivative (effective portion)			
	Three Months Ended June 30,		Six Months Ended June 30,	
	2016	2015	2016	2015
	(in thousands)			
Interest rate swaps	$(12)	$(12)	$(48)	$(71)

The following table summarizes the reclassifications out of accumulated other comprehensive loss for the three and six months ended June 30, 2016 and 2015:

Details about AOCI Components	Amount reclassified from AOCI into income (effective portion)				Location of amount
	Three Months Ended June 30,		Six Months Ended June 30,		reclassified from AOCI
	2016	2015	2016	2015	into income (effective portion)
	(in thousands)		(in thousands)		
Interest rate swaps	$ 10	$ 24	$ 23	$ 50	Interest expense

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As of June 30, 2016, $28,000 of deferred losses on derivative instruments accumulated in AOCI are expected to be reclassified to earnings during the next twelve months. Transactions and events expected to occur over the next twelve months that will necessitate reclassifying these derivatives' losses to earnings include the repricing of variable-rate debt. There were no cash flow hedges discontinued during 2016 or 2015.

16. Fair Value Measurements

Fair value measurement is defined as the price that would be received to sell an asset or paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants at the measurement date. A fair value hierarchy is established, which prioritizes the inputs used in measuring fair value into three broad levels as follows:

Level 1—Quoted prices in active markets for identical assets or liabilities.

Level 2—Inputs, other than the quoted prices in active markets, that are observable either directly or indirectly.

Level 3—Unobservable inputs based on the Company's own assumptions.

The following tables present the fair value hierarchy for those liabilities measured at fair value on a recurring basis:

	Fair Value as of June 30, 2016			
(In thousands)	Level 1	Level 2	Level 3	Total
Liabilities:				
Interest rate swap agreements	$-	$ 35	$ -	$ 35

	Fair Value as of December 31, 2015			
(In thousands)	Level 1	Level 2	Level 3	Total
Liabilities:				
Interest rate swap agreements	$-	$ 10	$ -	$ 10

The Company uses the market approach technique to value its financial liabilities. The Company's financial liabilities carried at fair value include derivative instruments used to hedge the Company's interest rate risks. The fair value of

the Company’s interest rate swap agreements was based on LIBOR yield curves at the reporting date.

17. Income Tax

Income tax was an approximately $0.1 million benefit and a $0.8 million benefit for the three months ended June 30, 2016 and 2015, respectively. The tax benefit for the three months ended June 30, 2016 reflects the incremental benefit recorded for the six months ended June 30, 2016 associated with the actual results for the six-month period, as described below. Discrete items included in the tax benefit for the three months ended June 30, 2016 included foreign currency gains and losses and a return to provision adjustment. Tax benefit for the three months ended June 30, 2015 included incentive stock option exercises partially offset by non-deductible acquisition costs.

Income tax was an approximately $0.1 million expense and $1.1 million benefit for the six months ended June 30, 2016 and 2015, respectively. The effective income tax rate was (11.5%) for the six months ended June 30, 2016, compared with 53.1% for the same period in 2015. The tax rates for the six months ended June 30, 2016 and 2015 were based on actual results for the six-month period rather than an effective tax rate estimated for the entire year. The Company determined that using a year-to-date approach resulted in a better estimate of income tax expense based on its forecast of pre-tax income, the mix of income across several jurisdictions with different statutory tax rates, and the impact of the full valuation allowance against U.S. deferred tax assets.

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The difference between the Company's effective tax rate period over period was primarily attributable to the mix of earnings between its domestic and foreign businesses, as well as the impact of the full valuation allowance against U.S deferred tax assets recorded as of December 31, 2015.

In November 2015, the FASB issued ASU 2015-17, *Balance Sheet Classification of Deferred Taxes*. The update requires all deferred income taxes to be presented on the balance sheet as noncurrent. The new guidance is intended to simplify financial reporting by eliminating the requirement to classify deferred taxes between current and noncurrent. The update is effective for fiscal years beginning after December 15, 2016. Early adoption is permitted at the beginning of an interim or annual period. During the six months ended June 30, 2016, the Company early adopted the new guidance on a prospective basis and has presented all deferred tax assets and deferred tax liabilities as noncurrent in the consolidated balance sheet at June 30, 2016. Prior periods presented in the consolidated financial statements were not retrospectively adjusted.

Item 2. ***Management's Discussion and Analysis of Financial Condition and Results of Operations.***

Forward-Looking Statements

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This Quarterly Report on Form 10-Q contains statements that are not statements of historical fact and are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 (the "Exchange Act"). The forward-looking statements are principally, but not exclusively, contained in "Item 2: Management's Discussion and Analysis of Financial Condition and Results of Operations." These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Forward-looking statements include, but are not limited to, statements about management's confidence or expectations, and our plans, objectives, expectations and intentions that are not historical facts. In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "could," "would," "seek," "expects," "plans," "aim," "anticipates," "believes," "estimates," "projects," "predicts," "intends," "think," "potential," "objectives," "optimistic," "strategy," "goals," "sees," "new," "guidance," "future," "continue," "drive," "growth," "long-term," "projects," "develop," "possible," "emerging," "opportunity," "pursue" and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Factors that may cause our actual results to differ materially from those in the forward-looking statements include reductions in customers' research budgets or government funding; domestic and global economic conditions; economic, political and other risks associated with international revenues and operations; currency exchange rate fluctuations; economic and political conditions generally and those affecting pharmaceutical and biotechnology industries; the seasonal nature of purchasing in Europe; our failure to expand into foreign countries and international markets; our failure to realize the expected benefits of facility consolidations; our inability to manage our growth; competition from our competitors; material weakness in our internal control over financial reporting; ineffective disclosure controls and procedures; failure or inadequacy of the our information technology structure; impact of difficulties implementing our enterprise resource planning systems; our failure to identify potential acquisition candidates and successfully close such acquisitions with favorable pricing or integrate acquired businesses or technologies; unanticipated costs relating to acquisitions and known and unknown costs arising in connection with our consolidation of business functions and any restructuring initiatives; our inability to effectively sell spectrophotometer products following the retirement of the GE Healthcare brand; failure of any banking institution in which we deposit our funds or its failure to provide services; our substantial debt and our ability to meet the financial covenants contained in our credit facility; our failure to raise or generate capital necessary to implement our acquisition and expansion strategy; the failure of our spin-off of Biostage, Inc., f/k/a Harvard Apparatus Regenerative Technology, Inc., to qualify as a transaction that is generally tax-free for U.S. federal income tax purposes; the failure of Biostage to indemnify us for any liabilities associated with Biostage's business; impact of any impairment of our goodwill or intangible assets; our ability to retain key personnel; failure or inadequacy or our information technology structure; rising commodity and precious metals costs; our ability to protect our intellectual property and operate without infringing on others' intellectual property; exposure to product and other liability claims; global stock market volatility, currency exchange rate fluctuations and regulatory changes caused by the United Kingdom's likely exit from the European Union; plus other factors described under the heading "Item 1A. Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2015, or described in our other public filings. Our results may also be affected by factors of which we are not currently aware. We may not update these forward-looking statements, even though our situation may change in the future, unless we have obligations under the federal securities laws to update and disclose material developments related to previously disclosed information.

Overview

Harvard Bioscience, Inc., a Delaware corporation, is a global developer, manufacturer and marketer of a broad range of scientific instruments, systems and lab consumables used to advance life science for basic research, drug discovery, clinical and environmental testing. Our products are sold to thousands of researchers in over 100 countries through our global sales organization, websites, catalogs, and through distributors including Thermo Fisher Scientific Inc., VWR, and other specialized distributors. We have sales and manufacturing operations in the United States, the United Kingdom, Germany, Sweden, Spain, France, Canada, and China.

At the end of 2013 we began a multiple year restructuring program to reduce costs, align global functions, consolidate facilities, and reinvest in key areas such as sales and IT. As part of the reinvestment, we initiated a multiple year plan in 2014 to invest in and implement a new global enterprise resource planning platform. Additionally, during 2014, as part of the restructuring program, we initiated plans to relocate and consolidate the distribution, finance and marketing operations of our Denville Scientific, Inc. subsidiary (“Denville Scientific”) to Charlotte, North Carolina and our Holliston, MA headquarters, and relocate the manufacturing operations of our Biochrom Ltd. subsidiary (“Biochrom”) to our Holliston, MA headquarters. During the first quarter of 2015, we initiated plans to relocate the operations of our subsidiary, Coulbourn Instruments, LLC (“Coulbourn”), to our Holliston, MA headquarters. During the second quarter of 2015, we initiated plans to relocate the operations of HEKA Electronics Incorporated, our HEKA Canada subsidiary (“HEKA Canada”), to HEKA Electronik Dr. Schulze GmbH, our HEKA Germany subsidiary (“HEKA Germany”). Also during the second quarter of 2015, and simultaneously with the HEKA Canada move, we initiated plans to relocate the operations of HEKA Instruments Incorporated, our United States HEKA subsidiary (“HEKA U.S.”, and together with HEKA Canada and HEKA Germany, “HEKA”), to our Holliston, MA headquarters. As of December 31, 2015, these relocation plans have been completed. Additionally, we committed to a restructuring plan on October 27, 2015, which included eliminating certain redundancies as a result of our site consolidations, as well as a realignment of our commercial sales team. We believe the overall restructuring program positions us to stabilize, focus on, and grow the life science business going forward.

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During the third quarter of 2015, GE Healthcare informed us of its decision to discontinue the sale of its spectrophotometer products by the end of 2015. This line of products includes the GE brands NanoVue and SimpliNano, which we manufacture and distributed through GE. Since January 1, 2016, we have been selling the NanoVue and SimpliNano spectrophotometers through our own direct sales force and through distribution partners, as well as servicing previously sold products in the field, yielding a new source of revenue and higher gross margins.

Our Strategy

Our vision is to be a world leading life science company that excels in meeting the needs of our customers by providing a wide breadth of innovative products and solutions, while providing exemplary customer service. Our business strategy is to grow our top-line and bottom-line, and build shareholder value through a commitment to:

Ÿ commercial excellence and organic growth;

Ÿ new product development;

Ÿ strategic acquisitions; and

Ÿ operational efficiencies.

Components of Operating Income

Revenues. We generate revenues by selling apparatus, instruments, devices and consumables through our distributors, direct sales force, websites and catalogs. Our websites and catalogs serve as the primary sales tools for our Cell and Animal Physiology product line. This product line includes both proprietary manufactured products and complementary products from various suppliers. Our reputation as a leading producer in many of our manufactured products creates traffic to our website, enables cross-selling and facilitates the introduction of new products. We have field sales teams in the U.S., Canada, the United Kingdom, Germany, France, Spain and China. In those regions where we do not have a direct sales team, we use distributors. Revenues from direct sales to end users represented approximately 65% and 63% of our revenues for the three months ended June 30, 2016 and 2015, respectively. For the six months ended June 30, 2016 and 2015, revenues from direct sales to end users represented approximately 63% and 62% of our revenues, respectively.

Products in our Molecular Separation and Analysis product line are generally sold by distributors, and are typically priced in the range of $5,000-$15,000. They are mainly scientific instruments like spectrophotometers and plate

readers that analyze light to detect and quantify a wide range of molecular and cellular processes, or apparatus like gel electrophoresis units. We also use distributors for both our catalog products and our higher priced products, as well as for sales in locations where we do not have subsidiaries or where we have existing distributors in place from acquired businesses. For the three months ended June 30, 2016 and 2015, approximately 35% and 37% of our revenues, respectively, were derived from sales to distributors. For the six months ended June 30, 2016 and 2015, approximately 37% and 38% of our revenues, respectively, were derived from sales to distributors.

For the three and six months ended June 30, 2016, approximately 63% and 62% of our revenues, respectively, were derived from products we manufacture, approximately 12% and 14%, respectively, were derived from complementary products we distribute in order to provide the researcher with a single source for all equipment needed to conduct a particular experiment, and approximately 25% and 24%, respectively, were derived from distributed products sold under our brand names. For the three and six months ended June 30, 2015, approximately 59% and 62% of our revenues, respectively, were derived from products we manufacture, approximately 16% and 13%, respectively, were derived from complementary products we distribute in order to provide the researcher with a single source for all equipment needed to conduct a particular experiment, and approximately 25%, for both periods, were derived from distributed products sold under our brand names.

For the three months ended June 30, 2016 and 2015, approximately 38% and 42% of our revenues, respectively, were derived from sales made by our non-United States operations. For the six months ended June 30, 2016 and 2015, approximately 38% and 42% of our revenues, respectively, were derived from sales made by our non-United States operations.

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Changes in the relative proportion of our revenue sources between direct sales and distribution sales are primarily the result of a different sales proportion of acquired companies and changes in geographic mix.

Cost of revenues. Cost of revenues includes material, labor and manufacturing overhead costs, obsolescence charges, packaging costs, warranty costs, shipping costs and royalties. Our cost of revenues may vary over time based on the mix of products sold. We sell products that we manufacture and products that we purchase from third parties. The products that we purchase from third parties typically have a higher cost of revenues as a percent of revenues because the profit is effectively shared with the original manufacturer. We anticipate that our manufactured products will continue to have a lower cost of revenues as a percentage of revenues as compared with the cost of non-manufactured products for the foreseeable future. Additionally, our cost of revenues as a percent of revenues will vary based on mix of direct to end user sales and distributor sales, mix by product line and mix by geography.

Sales and marketing expenses. Sales and marketing expense consists primarily of salaries and related expenses for personnel in sales, marketing and customer support functions. We also incur costs for travel, trade shows, demonstration equipment, public relations and marketing materials, consisting primarily of the printing and distribution of our catalogs, supplements and the maintenance of our websites. We may from time to time expand our marketing efforts by employing additional technical marketing specialists in an effort to increase sales of selected categories of products. We may also from time to time expand our direct sales organizations in an effort to concentrate on key accounts or promote certain product lines.

General and administrative expenses. General and administrative expense consists primarily of salaries and other related costs for personnel in executive, finance, accounting, information technology and human resource functions. Other costs include professional fees for legal and accounting services, information technology infrastructure, facility costs, investor relations, insurance and provision for doubtful accounts.

Research and development expenses. Research and development expense consists primarily of salaries and related expenses for personnel and spending to develop and enhance our products. Other research and development expense includes fees for consultants and outside service providers, and material costs for prototype and test units. We expense research and development costs as incurred. We believe that investment in product development is a competitive necessity and plan to continue to make these investments in order to realize the potential of new technologies that we develop, license or acquire for existing markets.

Restructuring charges. Restructuring charges consist of severance, other personnel-related charges and exit costs related to plans to create organizational efficiencies and reduce operating expenses.

Stock-based compensation expenses. Stock-based compensation expense for the three months ended June 30, 2016 and 2015 was $0.9 million and $0.7 million, respectively. Stock-based compensation expense for the six months

ended June 30, 2016 and 2015 was $1.7 million and $1.3 million, respectively. The stock-based compensation expense related to stock options, restricted stock units, restricted stock units with a market condition and the employee stock purchase plan and was recorded as a component of cost of revenues, sales and marketing expenses, general and administrative expenses and research and development expenses.

Bookings and Backlog

We monitor bookings and backlog as these are indicators of future revenues and business activity levels.

Bookings were $24.5 million and $27.6 million for the three months ended June 30, 2016 and 2015, respectively. Excluding the effects of currency translation, our bookings decreased $2.9 million, or 10.5% from the three months ended June 30, 2015. Bookings were $50.6 million and $54.3 million for the six months ended June 30, 2016 and 2015, respectively. Excluding the effects of currency translation, our bookings decreased $3.1 million, or 5.7% from the six months ended June 30, 2015.

Our order backlog was approximately $6.5 million and $6.6 million as of June 30, 2016 and 2015, respectively. Excluding the effects of currency translation, our backlog increased $0.1 million, or 0.9% from June 30, 2015. We include in backlog only those orders for which we have received valid purchase orders. Purchase orders may be cancelled at any time prior to shipment. Our backlog as of any particular date may not be representative of actual sales for any succeeding period.

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Selected Results of Operations

Three Months Ended June 30, 2016 compared to Three Months Ended June 30, 2015

	Three Months Ended June 30,		Dollar	%
	2016	2015	Change	Change
	(dollars in thousands)			
Revenues	$26,136	$28,800	$(2,664)	-9.3 %
Cost of revenues	14,461	16,205	(1,744)	-10.8%
Gross margin percentage	44.7 %	43.7 %	N/A	2.1 %
Sales and marketing expenses	5,086	5,128	(42)	-0.8 %
General and administrative expenses	5,236	4,922	314	6.4 %
Research and development expenses	1,502	1,714	(212)	-12.4%
Restructuring charges	1	54	(53)	-98.1%
Amortization of intangible assets	690	678	12	1.8 %

Each reporting period, we face currency exposure that arises from translating the results of our worldwide operations to the United States dollar at exchange rates that fluctuate from the beginning of such period. We evaluate our results of operations on both a reported and a foreign currency-neutral basis, which excludes the impact of fluctuations in foreign currency exchange rates. We believe that disclosing this non-GAAP financial information provides investors with an enhanced understanding of the underlying operations of the business. This non-GAAP financial information approximates information used by our management to internally evaluate our operating results. The non-GAAP financial information provided below should be considered in addition to, not as a substitute for, the financial information provided and presented in accordance with accounting principles generally accepted in the United States, or GAAP.

Revenues

Revenues for the three months ended June 30, 2016 were $26.1 million, a decrease of approximately 9.3%, or $2.7 million, compared to revenues of $28.8 million for the three months ended June 30, 2015.

The decrease in revenues was primarily driven by the timing of orders for the quarter, as well as, and to a lesser extent the negative effect of GE Healthcare discontinuing the sale of its spectrophotometer products and currency translation. The impact of the GE discontinuation and currency translation amounted to approximately $0.5 million and $0.2 million, respectively, in lower revenues during the three months ended June 30, 2016. Excluding the impact of

currency translation, revenues decreased approximately 8.6%.

Reconciliation of Changes In Revenues Compared to the Same Period of the Prior Year

	For the Three Months Ended June 30, 2016	
Decline	-8.6	%
Foreign exchange effect	-0.7	%
Net revenue decline	-9.3	%

Cost of revenues

Cost of revenues were $14.5 million for the three months ended June 30, 2016, a decrease of $1.7 million, or 10.8%, compared with $16.2 million for the three months ended June 30, 2015. Gross profit margin as a percentage of revenues increased to 44.7% for the three months ended June 30, 2016 compared with 43.7% for 2015. The increase in gross profit margin was due to a decrease in purchase accounting fair value step-up charges for inventory recorded in 2015, as well as the savings associated with the relocation and consolidation of certain facilities in 2015, partially offset by lower revenues.

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Sales and marketing expenses

Sales and marketing expenses were $5.1 million for the three months ended June 30, 2016 which was flat compared to the same period in 2015.

General and administrative expenses

General and administrative expenses were $5.2 million for the three months ended June 30, 2016, an increase of $0.3 million, or 6.4%, compared with $4.9 million for the three months ended June 30, 2015. The increase was primarily due to the forensic investigation costs incurred during the three months ended June 30, 2016 related to the previously disclosed embezzlement at one of our subsidiaries in 2015 and higher stock compensation expense, partially offset by the impact of our restructuring activities.

Research and development expenses

Research and development expenses were $1.5 million for the three months ended June 30, 2016, a decrease of $0.2 million, or 12.4%, compared with $1.7 million for the three months ended June 30, 2015. The decrease was primarily due to the impact of our restructuring activities.

Restructuring

Restructuring charges were immaterial for the three months ended June 30, 2016 compared with $54,000 for the three months ended June 30, 2015. Restructuring charges during the three months ended June 30, 2015 included additional charges related to a 2014 restructuring plan as well as charges related to two restructuring plans we implemented during the six months ended June 30, 2015. The 2014 restructuring plan realigned global operations and included actions to move the Biochrom manufacturing and Denville Scientific distribution operations to Holliston, MA and Charlotte, NC, respectively. The 2015 restructuring plans included actions to move the Coulbourn and operations to Holliston, MA and the HEKA Canada operations to HEKA Germany. Restructuring charges recorded during the three months ended June 30, 2016 included additional charges related to the restructuring plans described above.

Amortization of intangible assets

Amortization of intangible asset expenses was $0.7 million for both three months ended June 30, 2016 and 2015.

Other income (expense), net

Other income (expense), net, was $0.1 million of income and $0.5 million of expense for the three months ended June 30, 2016 and 2015, respectively. Included in other income (expense), net for both three months ended June 30, 2016 and 2015 was interest expense of $0.2 million. The decrease in other income (expense), net was primarily due to a decrease in acquisition related costs, including due diligence and deal investigative activities and currency exchange rate fluctuations. Acquisition related costs for the three months ended June 30, 2016 were $0, compared to $0.2 million in during the three months ended June 30, 2015. Currency exchange rate fluctuations included as a component of net loss resulted in approximately $0.3 million in currency gains during the three months ended June 30, 2016, compared to $0.1 million in currency losses during the three months ended June 30, 2015.

Income taxes

Income tax was an approximately $0.1 million and $0.8 million benefit for the three months ended June 30, 2016 and 2015, respectively. The tax benefit for the three months ended June 30, 2016 reflects the incremental benefit recorded for the six months ended June 30, 2016 associated with the actual results for the six-month period. Refer to the selected results of operations for the six months ended June 30, 2016 for further details. Discrete items included in the tax benefit for the three months ended June 30, 2016 included foreign currency gains and losses and a return to provision adjustment. Tax benefit for the three months ended June 30, 2015 included incentive stock option exercises partially offset by non-deductible acquisition costs.

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Six Months Ended June 30, 2016 compared to Six Months Ended June 30, 2015

	Six Months Ended June 30,		**Dollar**	**%**
	2016	2015	Change	Change
	(dollars in thousands)			
Revenues	$53,099	$54,563	$(1,464)	-2.7 %
Cost of product revenues	28,479	30,490	(2,011)	-6.6 %
Gross margin percentage	46.4 %	44.1 %	N/A	5.1 %
Sales and marketing expenses	10,188	10,327	(139)	-1.3 %
General and administrative expenses	11,184	9,753	1,431	14.7 %
Research and development expenses	2,927	3,462	(535)	-15.5%
Restructuring charges	12	111	(99)	-89.2%
Amortization of intangible assets	1,370	1,471	(101)	-6.9 %

Each reporting period, we face currency exposure that arises from translating the results of our worldwide operations to the United States dollar at exchange rates that fluctuate from the beginning of such period. We evaluate our results of operations on both a reported and a foreign currency-neutral basis, which excludes the impact of fluctuations in foreign currency exchange rates. We believe that disclosing this non-GAAP financial information provides investors with an enhanced understanding of the underlying operations of the business. This non-GAAP financial information approximates information used by our management to internally evaluate our operating results. The non-GAAP financial information provided below should be considered in addition to, not as a substitute for, the financial information provided and presented in accordance with accounting principles generally accepted in the United States, or GAAP.

Revenues

Revenues decreased 2.7%, or $1.5 million to $53.1 million for the six months ended June 30, 2016 compared to revenues of $54.6 million for the same period in 2015. Excluding the effects of currency translation, our revenues decreased 1.7% from the previous six months. The decrease was primarily the result of the impact of the discontinuation of GE sales.

Reconciliation of Changes In Revenues Compared to the Same Period of the Prior Year

	For the Six Months Ended June 30, 2016
Decline	-1.7 %

Foreign exchange effect	-1.0	%
Net revenue decline	-2.7	%

Cost of revenues

Cost of revenues decreased $2.0 million, or 6.6%, to $28.5 million for the six months ended June 30, 2016 compared with $30.5 million for the six months ended June 30, 2015. Gross profit margin as a percentage of revenues increased to 46.4% for the six months ended June 30, 2016 compared with 44.1% for 2015. The increase in gross profit margin was due to a decrease in purchase accounting fair value step-up charges for inventory recorded in 2015, as well as the savings associated with the relocation and consolidation of certain facilities in 2015, partially offset by lower revenues.

Sales and marketing expenses

Sales and marketing expenses decreased $0.1 million, or 1.3%, to $10.2 million for the six months ended June 30, 2016 compared with $10.3 million for the six months ended June 30, 2015. The decrease was primarily the result of our restructuring activities.

General and administrative expenses

General and administrative expenses increased $1.4 million, or 14.7%, to $11.2 million for the six months ended June 30, 2016 compared with $9.8 million for the six months ended June 30, 2015. The increase was primarily due to the forensic investigation costs incurred during the six months ended June 30, 2016 related to the previously disclosed embezzlement at one of our subsidiaries in 2015 and higher stock compensation expense, partially offset by the impact of our restructuring activities.

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Research and development expenses

Research and development expenses were $2.9 million for the six months ended June 30, 2016, a decrease of $0.6 million, or 15.5%, compared with $3.5 million for the six months ended June 30, 2015. The decrease was primarily due to the impact of our restructuring activities.

Restructuring

Restructuring charges were immaterial for the six months ended June 30, 2016 compared with $0.1 million for the six months ended June 30, 2015. Restructuring charges during the six months ended June 30, 2015 included additional charges related to a 2014 restructuring plan as well as charges related to two restructuring plans we implemented during the six months ended June 30, 2015. The 2014 restructuring plan realigned global operations and included actions to move the Biochrom manufacturing and Denville Scientific distribution operations to Holliston, MA and Charlotte, NC, respectively. The 2015 restructuring plans included actions to move the Coulbourn and operations to Holliston, MA and the HEKA Canada operations to HEKA Germany. Restructuring charges recorded during the six months ended June 30, 2016 included additional charges related to the restructuring plans described above.

Amortization of intangible assets

Amortization of intangible asset expenses was $1.4 million for the six months ended June 30, 2016, as compared to $1.5 million for the six months ended June 30, 2015.

Other income (expense), net

Other income (expense), net, was an expense of $0.1 million and $1.1 million for the six months ended June 30, 2016 and 2015, respectively. The decrease in other income (expense), net was primarily due to a decrease in interest expense, acquisition related costs, including due diligence and deal investigative activities and currency exchange rate fluctuations. Interest expense was $0.3 million for the six months ended June 30, 2016, compared to $0.4 million in interest expense for the six months ended June 30, 2015. The decrease in interest expense of $0.1 million was due to lower debt balances as a result of payment of principal. Acquisition related costs for the six months ended June 30, 2016 were $6,000, compared to $0.8 million for the six months ended June 30, 2015.

Income taxes

Income tax expense was approximately a $0.1 million expense and a $1.1 million benefit for the six months ended June 30, 2016 and 2015, respectively. The effective income tax rate was (11.5%) for the six months ended June 30, 2016, compared with 53.1% for the same period in 2015. The tax rates for the six months ended June 30, 2016 and 2015, respectively, were based on actual results for the six-month period rather than an effective tax rate estimated for the entire year. We determined that using a year-to-date approach resulted in a better estimate of income tax expense based on our updated forecasts of pre-tax income, mix of income across several jurisdictions with different statutory tax rates as well as the impact of the full valuation allowance against U.S. deferred tax assets.

The difference between our effective tax rate period over period was attributable to the mix of earnings between our domestic and foreign businesses as well as the impact of the full valuation allowance against U.S. deferred tax assets recorded as of December 31, 2015.

Liquidity and Capital Resources

Historically, we have financed our business through cash provided by operating activities, the issuance of common stock, and bank borrowings. Our liquidity requirements arise primarily from investing activities, including funding of acquisitions, and other capital expenditures. As previously discussed, on January 8, 2015, we acquired all of the issued and outstanding shares of HEKA, a manufacturer with operations in Germany and Canada for approximately $4.5 million, net of cash acquired. We funded the acquisition from our existing cash balances by utilizing approximately $5.9 million of our foreign cash on hand.

As of June 30, 2016, we held cash and cash equivalents of $3.6 million, compared with $6.7 million at December 31, 2015. As of June 30, 2016 and December 31, 2015, we had $16.2 million and $18.7 million, respectively, of borrowings outstanding under our credit facility, net of deferred financing costs. Total debt, net of cash and cash equivalents was $12.5 million at June 30, 2016, compared to $12.0 million at December 31, 2015. In addition, we had an underfunded United Kingdom pension liability of approximately $2.6 million and $2.8 million at June 30, 2016 and December 31, 2015, respectively.

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As of June 30, 2016 and December 31, 2015, cash and cash equivalents held by our foreign subsidiaries was $2.4 million and $5.7 million, respectively. Funds held by our foreign subsidiaries are not available for domestic operations unless the funds are repatriated. If we planned to or did repatriate these funds, then United States federal and state income taxes would have to be recorded on such amounts. Our reinvestment determination is based on the future operational and capital requirements of our U.S. and non-U.S. operations. As of December 31, 2015, we determined that the assertion of permanent reinvestment at our foreign subsidiaries in Canada and France was no longer appropriate and we repatriated approximately $3.2 million during the six months ended June 30, 2016. The total tax liability associated with the repatriation of undistributed earnings in Canada and France was approximately $1.7 million, however the liability was entirely offset by the foreign tax credits generated from the repatriation. We currently have no plans and do not intend to repatriate any of our undistributed foreign earnings in any other countries outside of Canada and France. These balances are considered permanently reinvested and will be used for foreign items including foreign acquisitions, capital investments, pension obligations and operations. It is impracticable to estimate the total tax liability, if any, which would be created by the future distribution of these earnings.

We currently intend to retain all of our earnings to finance the expansion and development of our business and do not anticipate paying any cash dividends to holders of our common stock in the near future. As a result, capital appreciation, if any, of our common stock will be a stockholder's sole source of gain for the near future.

Condensed Cash Flow Statements

(unaudited)

	Six Months Ended June 30,	
	2016	2015
	(in thousands)	
Cash flows from operations:		
Net loss	$(1,349)	$(1,052)
Changes in assets and liabilities	(2,377)	(2,402)
Other adjustments to operating cash flows	3,942	2,473
Net cash provided by (used) in operating activities	216	(981)
Investing activities:		
Additions to property, plant and equipment	(402)	(1,640)
Acquisitions, net of cash acquired	-	(4,545)
Other investing activities	(10)	15
Net cash used in investing activities	(412)	(6,170)
Financing activities:		
Net (repayments of) proceeds from issuance of debt	(2,625)	(800)
Other financing activities	(9)	1,832
Net cash (used in) provided by financing activities	(2,634)	1,032

Effect of exchange rate changes on cash	(283)	(613)
(Decrease) increase in cash and cash equivalents	$(3,113)	$(6,732)

Our operating activities provided cash of $0.2 million and used $1.0 million of cash for the six months ended June 30, 2016 and 2015, respectively. The increase in cash flows from operations was primarily due to changes in working capital and other adjustments to operating cash flows partially offset by forensic investigation costs incurred during the six months ended June 30, 2016 related to the previously disclosed embezzlement at one of our subsidiaries in 2015

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Our investing activities used cash of $0.4 million and $6.2 million for the six months ended June 30, 2016 and 2015, respectively. Investing activities during the six months ended June 30, 2016 included cash used for purchases of property, plant and equipment. Investing activities during the six months ended June 30, 2015 included cash used for acquisitions net of cash acquired and purchases of property, plant and equipment. We spent $0.4 million and $1.6 million on capital expenditures during the six months ended June 30, 2016 and 2015, respectively. The decrease in capital expenditures period over period was due primarily to the capital expenditures for the six months ended June 30, 2015 related to the first phase implementation of a new enterprise resource planning ("ERP") platform across all of our locations, as well as capital spend to relocate our Denville distribution business and UK manufacturing operations to North Carolina and Holliston, MA, respectively. Additionally, in January 2015, we acquired HEKA for approximately $4.5 million, net of cash acquired.

Our financing activities have historically consisted of borrowings and repayments under our revolving credit facility and term loans, payments of debt issuance costs and the issuance of common stock. During the six months ended June 30, 2016, financing activities used cash of $2.6 million, compared with $1.0 million of cash provided by financing activities for the six months ended June 30, 2015. During the six months ended June 30, 2016, we borrowed $2.0 million under our credit facility, repaid $4.6 million of debt under our credit facility and term loans and ended the quarter with $16.2 million of borrowings, net of deferred financing costs of $0.1 million. Net cash paid for tax withholdings from the issuance of common stock for the six months ended June 30, 2016 was $9,000, which related to the vesting of restricted stock units and the exercise of stock options. During the six months ended June 30, 2015, we borrowed $4.1 million under our credit facility, repaid $4.9 million of debt under our credit facility and term loans and ended with $20.7 million of borrowings at June 30, 2015. Net proceeds from the issuance of common stock for the six months ended June 30, 2015 were $1.9 million, which related to the exercise of stock options.

Borrowing Arrangements

On August 7, 2009, we entered into an Amended and Restated Revolving Credit Loan Agreement related to a $20.0 million revolving credit facility with Bank of America, as agent, and Bank of America and Brown Brothers Harriman & Co as lenders (as amended, the "2009 Credit Agreement"). On September 30, 2011, we entered into the First Amendment to the Amended and Restated Revolving Credit Loan Agreement (the "First Amendment") with Bank of America as agent, and Bank of America and Brown Brothers Harriman & Co as lenders. The First Amendment extended the maturity date of our credit facility to August 7, 2013 and reduced the interest rate to the London Interbank Offered Rate plus 3.0%. On October 4, 2012, we entered into the Second Amendment to the Amended and Restated Revolving Credit Loan Agreement (the "Second Amendment") with Bank of America as agent, and Bank of America and Brown Brothers Harriman & Co as lenders. The Second Amendment extended the maturity date of our credit facility to August 7, 2014.

On March 29, 2013, we entered into a Second Amended and Restated Revolving Credit Agreement (as amended, the "Credit Agreement") with Bank of America, as agent, and Bank of America and Brown Brothers Harriman & Co as lenders, that amended and restated the 2009 Credit Agreement. The Credit Agreement converted our existing outstanding revolving advances into a term loan in the principal amount of $15.0 million (the "Term Loan"), provided a revolving credit facility in the maximum principal amount of $25.0 million ("Revolving Line") and provided a delayed

draw term loan of up to $15.0 million (the "DDTL") to fund our capital contributions to Biostage. The maximum amount available under the Credit Agreement is $50.0 million as borrowings against the DDTL in excess of $10.0 million result in a dollar for dollar reduction in the Revolving Line capacity. The Revolving Line, Term Loan and DDTL each have a maturity date of March 29, 2018 (the maturity date of the Revolving Line was extended from March 29, 2016 in connection with the Third Amendment discussed below).

On October 31, 2013, we amended the Credit Agreement to reduce the DDTL from up to $15.0 million to up to $10.0 million and allow for an additional $5.0 million to be available for drawing as advances under the Revolving Line.

On April 24, 2015, we entered into the Third Amendment to the Second Amended and Restated Credit Agreement (the "Third Amendment"), which extended the maturity date of the Revolving Line to March 29, 2018 and reduced the interest rates on the Revolving Line, Term Loan and DDTL. Borrowings under the Term Loan and the DDTL accrued interest at a rate based on either the effective London Interbank Offered Rate (LIBOR) for certain interest periods selected by us, or a daily floating rate based on the British Bankers' Association (BBA) LIBOR as published by Reuters (or other commercially available source providing quotations of BBA LIBOR), plus in either case, a margin of 2.75%. Prior to the Third Amendment, the Revolving Line accrued interest at a rate based on either the effective LIBOR for certain interest periods selected by us, or a daily floating rate based on the BBA LIBOR, plus in either case, a margin of 2.25%. We were required to fix the rate of interest on at least 50% of the Term Loan and the DDTL through the purchase of interest rate swaps. The Term Loan and DDTL each have interest payments due at the end of the applicable LIBOR period, or monthly with respect to BBA LIBOR borrowings, and principal payments due quarterly. The Revolving Line has interest payments due at the end of the applicable LIBOR period, or monthly with respect to BBA LIBOR borrowings.

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On June 30, 2015, we entered into the Fourth Amendment to the Second Amended and Restated Credit Agreement, which amended our quarterly minimum fixed charge coverage financial covenant.

On November 5, 2015, we entered into the Fifth Amendment to the Second Amended and Restated Credit Agreement, which eliminated our 2015 fourth quarter minimum fixed charge coverage financial covenant requirement. As part of this amendment, the maximum principal amount on the Revolving Line was reduced to $10.0 million until June 30, 2016. As of June 30, 2016, the maximum principal amount was restored to $25.0 million, based on our remaining in compliance with all covenants.

On March 9, 2016, we entered into the Sixth Amendment to the Second Amended and Restated Credit Agreement, which amended the principal payment amortization of the Term Loan and DDTL to five years, as well as amended our quarterly minimum fixed charge coverage financial covenant.

In April 2015, the FASB issued Accounting Standards Update No. 2015-03, *Interest - Imputation of Interest - Simplifying the Presentation of Debt Issuance Costs*. Under this guidance, debt issuance costs related to a recognized debt liability should be presented in the balance sheet as a direct deduction from the carrying amount of that debt liability. The provisions of this guidance are to be applied retrospectively and are effective for interim and annual periods beginning after December 15, 2015. We adopted this guidance during the six months ended June 30, 2016. The consolidated balance sheet as of December 31, 2015, included in these consolidated financial statements, reflects a restatement to reclassify unamortized deferred financing costs of approximately $0.2 million from other long-term assets to long-term debt. For deferred financing costs paid to secure long-term debt, we have made a policy election to present such costs as a direct deduction from the debt liability on the consolidated balance sheet.

At June 30, 2016, the weighted effective interest rates on the Term Loan, DDTL and Revolving Line borrowings were 3.96%, 3.57% and 2.71%, respectively. The Credit Agreement includes covenants relating to income, debt coverage and cash flow, as well as minimum working capital requirements. The Credit Agreement also contains limitations on our ability to incur additional indebtedness and requires lender approval for acquisitions funded with cash, promissory notes and/or other consideration in excess of $6.0 million and for acquisitions funded solely with equity in excess of $10.0 million. As of June 30, 2016, we were in compliance with all financial covenants contained in the Credit Agreement; we were subject to covenant and working capital borrowing restrictions, and had available borrowing capacity under the Credit Agreement of $6.3 million.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary as a result of a number of factors. Based on our current operations and current operating plans, we expect that our available cash, cash generated from current operations and debt capacity will be sufficient to finance current operations, any potential future acquisitions and capital expenditures for the next 12 months and beyond. This may involve incurring additional debt or raising equity capital for our business. Additional capital raising activities will dilute the ownership interests of existing stockholders to the extent we raise capital by issuing equity securities and we cannot guarantee that we will

be successful in raising additional capital on favorable terms or at all.

Critical Accounting Policies

The critical accounting policies underlying the accompanying unaudited consolidated financial statements are those set forth in Part II, Item 7 included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2015, which was filed with the SEC on April 29, 2016.

Impact of Foreign Currencies

Our international operations in some instances operate in a natural hedge as we sell our products in many countries and a substantial portion of our revenues, costs and expenses are denominated in foreign currencies, especially the British pound sterling, the Euro, the Canadian dollar and the Swedish krona.

During the six months ended June 30, 2016, the U.S dollar’s strengthening in relation to those currencies resulted in an unfavorable translation effect on our consolidated revenues and a neutral effect on our consolidated net loss. Changes in foreign currency exchange rates resulted in an unfavorable effect on revenues of approximately $0.5 million and a favorable effect on expenses of approximately $0.5 million. During the six months ended June 30, 2015, changes in foreign currency exchange rates resulted in an unfavorable effect on revenues of $2.4 million and a favorable effect on expenses of $2.1 million.

The loss associated with the translation of foreign equity into U.S. dollars included as a component of comprehensive loss during the three months ended June 30, 2016, was approximately $1.8 million, compared to a gain of $1.8 million for the three months ended June 30, 2015. For the six months ended June 30, 2016, the loss associated with the translation of foreign equity into U.S. dollars included as a component of comprehensive loss, was approximately $1.2 million, compared to a loss of $2.7 million during the same period in 2015.

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In addition, currency exchange rate fluctuations included as a component of net loss resulted in approximately $0.3 million in currency gains and $0.1 million in currency losses during the three months ended June 30, 2016, and 2015, respectively. Currency exchange rate fluctuations included as a component of net loss resulted in approximately $0.3 million and $0.1 million in currency gains during the six months ended June 30, 2016, and 2015, respectively.

Recently Issued Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2014-09, *"Revenue from Contracts with Customers,"* a new accounting standard that provides for a comprehensive model to use in the accounting for revenue arising from contracts with customers that will replace most existing revenue recognition guidance within accounting principles generally accepted in the United States. Under this standard, revenue will be recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which we expect to be entitled in exchange for those goods or services. At its July 2015 meeting, the FASB agreed to defer the mandatory effective date of ASU 2014-09 one year. Under the one year deferral, the standard will take effect in 2018 for calendar year-end public entities. We are assessing the new standard and have not yet determined the impact to our consolidated financial statements.

In July 2015, the FASB issued ASU 2015-11, *Simplifying Measurement of Inventory*. The update requires measurement of most inventory "at the lower of cost and net realizable value", and applies to all entities that recognize inventory within the scope of ASC 330, except for inventory measured under the last-in, first-out (LIFO) method or the retail inventory method (RIM). ASU 2015-11 requires prospective application and represents a change in accounting principle. The update is effective for fiscal years beginning after December 15, 2016. Early adoption is permitted for financial statements that have not been previously issued. We are evaluating the impact of ASU 2015-11 on our consolidated financial statements and the possibility of early adoption thereof.

In February 2016, the FASB issued ASU 2016-02, *Leases*, which is intended to improve financial reporting about leasing transactions. The update requires a lessee to record on the balance sheet the assets and liabilities for the rights and obligations created by lease terms of more than 12 months. The update is effective for fiscal years beginning after December 15, 2018. We are evaluating the impact of ASU 2016-02 on our consolidated financial statements.

In March 2016, the FASB issued ASU 2016-09, *Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*, which simplifies the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities and classification on the statement of cash flows. The update is effective for fiscal years beginning after December 15, 2016 and early adoption is permitted. We are evaluating the impact of ASU 2016-09 on our consolidated financial statements.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments – Credit Losses (Topic 326), Measurement of credit losses on Financial Instruments.* The update amends the FASB's guidance on the impairment of financial instruments. The ASU adds to U.S. GAAP an impairment model (known as the current expected credit loss (CECL) model) that is based on expected losses rather than incurred losses. Under the new guidance, an entity recognizes as an allowance its estimate of expected credit losses, which the FASB believes will result in more timely recognition of such losses. The ASU is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. We are evaluating the impact of ASU 2016-13 on our consolidated financial statements.

Recently Adopted Accounting Pronouncements

In April 2015, the FASB issued ASU 2015-03, *Interest - Imputation of Interest - Simplifying the Presentation of Debt Issuance Costs*. Under this guidance, debt issuance costs related to a recognized debt liability should be presented in the balance sheet as a direct deduction from the carrying amount of that debt liability. The provisions of this guidance are to be applied retrospectively and are effective for interim and annual periods beginning after December 15, 2015. We adopted this guidance during the six months ended June 30, 2016. The consolidated balance sheet as of December 31, 2015, included in these consolidated financial statements, reflects a restatement to reclassify unamortized deferred financing costs of approximately $0.2 million from other long-term assets to long-term debt. For deferred financing costs paid to secure long-term debt, we have made a policy election to present such costs as a direct deduction from the debt liability on the consolidated balance sheet.

In September 2015, the FASB issued ASU 2015-16, *Simplifying the Accounting for Measurement-Period Adjustments*. The update eliminates the requirement to retrospectively adjust financial statements for measurement-period adjustments that occur in periods after a business combination. Under the update, measurement-period adjustments are to be calculated as if they were known at the acquisition date, but are recognized in the reporting period in which they are determined. Additional disclosures are required about the impact on current-period earnings. ASU 2015-16 requires prospective application to adjustments of provisional amounts that occur after the effective date. The update was effective for fiscal years beginning after December 15, 2015. We adopted this guidance during the six months ended June 30, 2016. The adoption of ASU 2015-16 did not have a material impact on our consolidated financial statements.

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In November 2015, the FASB issued ASU 2015-17, *Balance Sheet Classification of Deferred Taxes*. The update requires all deferred income taxes to be presented on the balance sheet as noncurrent. The new guidance is intended to simplify financial reporting by eliminating the requirement to classify deferred taxes between current and noncurrent. The update is effective for fiscal years beginning after December 15, 2016. Early adoption is permitted at the beginning of an interim or annual period. During the six months ended June 30, 2016, we early adopted the new guidance on prospective basis and have presented all deferred tax assets and deferred tax liabilities as noncurrent in the consolidated balance sheet at June 30, 2016. Prior periods presented in the consolidated financial statements were not retrospectively adjusted.

Item 3. ***Quantitative and Qualitative Disclosures about Market Risk.***

The majority of our manufacturing and testing of products occurs in our facilities in the United States, Germany, Sweden and Spain. We sell our products globally through our distributors, direct sales force, websites and catalogs. As a result, our financial results are affected by factors such as changes in foreign currency exchange rates and weak economic conditions in foreign markets.

We collect amounts representing a substantial portion of our revenues and pay amounts representing a substantial portion of our operating expenses in foreign currencies. As a result, changes in currency exchange rates from time to time may affect our operating results.

We are exposed to market risk from changes in interest rates primarily through our financing activities. As of June 30, 2016, we had $16.2 million outstanding under our Credit Agreement, net of deferred financing costs.

Prior to the Third Amendment, borrowings under the Term Loan and the DDTL accrued interest at a rate based on either the effective London Interbank Offered Rate (LIBOR) for certain interest periods selected by us, or a daily floating rate based on the BBA LIBOR as published by Reuters (or other commercially available source providing quotations of BBA LIBOR), plus in either case, a margin of 3.0%. Prior to the Third Amendment, the Revolving Line accrued interest at a rate based on either the effective LIBOR for certain interest periods selected by us, or a daily floating rate based on the BBA LIBOR, plus in either case, a margin of 2.5%. We were required to fix the rate of interest on at least 50% of the Term Loan and the DDTL through the purchase of an interest rate swap. The Term Loan and DDTL each have interest payments due at the end of the applicable LIBOR period, or monthly with respect to BBA LIBOR borrowings, and principal payments are due quarterly. The Revolving Line has interest payments due at the end of the applicable LIBOR period, or monthly with respect to BBA LIBOR borrowings. Effective June 5, 2013, we entered into an interest rate swap contract with an original notional amount of $15.0 million and a maturity date of March 29, 2018 in order to hedge the risk of changes in the effective benchmark interest rate (LIBOR) associated with our Term Loan. The swap contract converted specific variable-rate debt into fixed-rate debt and fixed LIBOR associated with the Term Loan at 0.96% plus a bank margin of 3.0%. Effective November 29, 2013, we

entered into a second interest rate swap contract with an original notional amount of $5.0 million and a maturity date of March 29, 2018 in order to hedge the risk of changes in LIBOR associated with a portion of our DDTL. The swap contract converted specific variable-rate debt into fixed rate debt and fixed LIBOR associated with half of the DDTL amount at 0.93% plus a bank margin of 3.0%. The notional amount of our derivative instruments as of June 30, 2016 was $7.5 million. These swap contracts were associated with reducing or eliminating interest rate risk and were designated as cash flow hedge instruments in accordance with ASC 815. We use interest-rate-related derivative instruments to manage our exposure related to changes in interest rates on our variable-rate debt instruments. We do not enter into derivative instruments for any purpose other than cash flow hedging and we do not speculate using derivative instruments.

On April 24, 2015, we entered the Third Amendment which extended the maturity date of the Revolving Line to March 29, 2018 and reduced the interest rate to the London Interbank Offered Rate plus 2.25%, 2.75% and 2.75% on the Revolving Line, Term Loan and DDTL, respectively.

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As of June 30, 2016, the weighted effective interest rates, net of the impact of our interest rate swaps, on our Term Loan , DDTL and Revolving Line borrowings were 3.96%, 3.57% and 2.71%, respectively. Assuming no other changes which would affect the margin of the interest rate under our Term Loan, DDTL and Revolving Line, the effect of interest rate fluctuations on outstanding borrowings under our Credit Agreement as of June 30, 2016 over the next twelve months is quantified and summarized as follows:

If compared to the rate as of June 30, 2016	Interest expense increase (in thousands)
Interest rates increase by 1%	$ 77
Interest rates increase by 2%	$ 155

Item 4. ***Controls and Procedures.***

Disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) are designed to ensure that information required to be disclosed in reports filed or submitted under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms and that such information is accumulated and communicated to management, including the Chief Executive Officer and the Chief Financial Officer, to allow timely decisions regarding required disclosures.

As required by Rules 13a-15(e) and 15d-15(e) under the Exchange Act, our management, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures as of June 30, 2016. Our disclosure controls and procedures are designed to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and our management necessarily was required to apply its judgment in evaluating and implementing our disclosure controls and procedures. Based upon the evaluation described above, our management concluded that our disclosure controls and procedures for the periods covered by this report were not effective, as of June 30, 2016, because of the material weaknesses in internal control over financial reporting described in Part II, Item 9A of our Annual Report on Form 10-K for the year ended December 31, 2015, filed with the SEC on April 29, 2016 (the "2015 Form 10-K"). Management has concluded that the material weaknesses that were present at December 31, 2015 were also present at June 30, 2016.

Notwithstanding the assessment that our internal controls over financial reporting were not effective and that there were material weaknesses as identified in the 2015 Form 10-K, we believe that our financial statements contained in our Quarterly Report on Form 10-Q for the fiscal quarter ended June 30, 2016, fairly present our financial condition, results of operations and cash flows in all material respects.

As previously disclosed in the 2015 Form 10-K, to remediate the material weaknesses described under the subheading "Management's Report on Internal Control Over Financial Reporting" in Item 9A of the 2015 Form 10-K, we plan to implement the remediation initiatives described under the subheading "Remediation Plan" in Item 9A of the 2015 Form 10-K and will continue to evaluate the remediation and may in the future implement additional measures.

We continue to take actions to remediate the material weaknesses related to our internal control over financial reporting, as described above and in our 2015 Form 10-K. However, there were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rules 13a-15 and 15d-15 under the Exchange Act that occurred during the quarter ended June 30, 2016 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1A. *Risk Factors.*

To our knowledge, except as set forth below, and except to the extent additional factual information disclosed in this Quarterly Report on Form 10-Q relates to such risk factors, there has been no material changes in the risk factors described in "Item 1A. Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2015, which was filed with the SEC on April 29, 2016.

Economic conditions and regulatory changes caused by the United Kingdom's likely exit from the European Union could adversely affect our business.

In June 2016, the United Kingdom (the "U.K.") held a referendum in which voters approved an exit from the European Union ("E.U."), commonly referred to as Brexit. It is expected that the U.K. government will initiate a process to withdraw from the E.U. and begin negotiating the terms of its separation. The announcement of Brexit has resulted in significant volatility in global stock market and currency exchange rate fluctuations that resulted in strengthening of the U.S. dollar relative to other foreign currencies in which we conduct business. The announcement of Brexit and the likely withdrawal of the U.K. from the E.U. may also create global economic uncertainty, including an uncertain funding environment for U.K. customers receiving funding from the E.U, which may cause our customers to closely monitor their costs and reduce their spending budgets. This could adversely affect our business, financial condition, operating results and cash flows.

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Item 6. Exhibits

Exhibit Index	
10.1	Limited Consent and Waiver dated as of May 5, 2016, by and among Harvard Bioscience, Inc., Bank of America, N.A. and Brown Brothers Harriman & Co.
10.2	Third Amendment to Employment Agreement, by and between Harvard Bioscience, Inc. and Jeffrey A. Duchemin, dated as of May 26, 2016 (incorporated by reference to Exhibit 10.1 to our Current Report on Form 8-K, as filed with the SEC on May 27, 2016).
10.3	Second Amendment to Employment Agreement, by and between Harvard Bioscience, Inc. and Robert E. Gagnon, dated as of May 26, 2016 (incorporated by reference to Exhibit 10.2 to our Current Report on Form 8-K, as filed with the SEC on May 27, 2016).
10.4	Employment Agreement, by and between Harvard Bioscience, Inc. and Yong Sun, dated as of May 26, 2016 (incorporated by reference to Exhibit 10.3 to our Current Report on Form 8-K, as filed with the SEC on May 27, 2016).
31.1	Certification of Chief Financial Officer of Harvard Bioscience, Inc., pursuant to Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Executive Officer of Harvard Bioscience, Inc., pursuant to Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1*	Certification of Chief Financial Officer of Harvard Bioscience, Inc., pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
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101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document

* 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.

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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 undersigned thereunto duly authorized.

Date: August 4, 2016

HARVARD BIOSCIENCE, INC.

By: /S/ JEFFREY A. DUCHEMIN
Jeffrey A. Duchemin
Chief Executive Officer

By: /S/ ROBERT E. GAGNON
Robert E. Gagnon
Chief Financial Officer

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