

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, 2021**

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

(State or other jurisdiction of
Incorporation or organization)

04-3306140

(I.R.S. Employer
Identification No.)

84 October Hill Road, Holliston, Massachusetts 01746
(Address of Principal Executive Offices, including zip code)

(508) 893-8999

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, \$0.01 par value	HBIO	The Nasdaq Global Market

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

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

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

Large accelerated filer

Non-accelerated filer

Accelerated filer

Smaller reporting company

Emerging growth company

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

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

As of July 30, 2021, there were 40,762,931 shares of the registrant's common stock issued and outstanding.

HARVARD BIOSCIENCE, INC.

FORM 10-Q

INDEX

	Page
<u>PART I - FINANCIAL INFORMATION</u>	
<u>Item 1. Financial Statements</u>	<u>3</u>
<u>Consolidated Balance Sheets as of June 30, 2021 and December 31, 2020 (unaudited)</u>	<u>3</u>
<u>Consolidated Statements of Operations for the Three and Six Months Ended June 30, 2021 and 2020 (unaudited)</u>	<u>4</u>
<u>Consolidated Statements of Comprehensive Income (Loss) for the Three and Six Months Ended June 30, 2021 and 2020 (unaudited)</u>	<u>5</u>
<u>Consolidated Statements of Stockholders' Equity for the Three and Six Months Ended June 31, 2021 and 2020 (unaudited)</u>	<u>6</u>
<u>Consolidated Statements of Cash Flows for the Six Months Ended June 30, 2021 and 2020 (unaudited)</u>	<u>7</u>
<u>Notes to Unaudited Consolidated Financial Statements</u>	<u>8</u>
<u>Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations</u>	<u>17</u>
<u>Item 3. Quantitative and Qualitative Disclosures about Market Risk</u>	<u>23</u>
<u>Item 4. Controls and Procedures</u>	<u>23</u>
<u>PART II - OTHER INFORMATION</u>	
<u>Item 1. Legal Proceedings</u>	<u>24</u>
<u>Item 1A. Risk Factors</u>	<u>24</u>
<u>Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.</u>	<u>25</u>
<u>Item 3. Default Upon Senior Securities</u>	<u>25</u>
<u>Item 4. Mine Safety Disclosures</u>	<u>25</u>
<u>Item 5. Other Information</u>	<u>25</u>
<u>Item 6. Exhibits</u>	<u>25</u>
<u>SIGNATURES</u>	<u>26</u>

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, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	\$ 6,237	\$ 8,317
Accounts receivable, net	17,391	17,766
Inventories	24,709	22,262
Other current assets	5,220	3,355
Total current assets	53,557	51,700
Property, plant and equipment, net	3,429	3,960
Operating lease right-of-use assets	7,241	7,761
Goodwill	58,424	58,590
Intangible assets, net	30,510	33,151
Other long-term assets	810	1,092
Total assets	\$ 153,971	\$ 156,254
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion of long-term debt	\$ 2,220	\$ 1,721
Current portion of operating lease liabilities	2,061	2,111
Accounts payable	7,489	5,972
Deferred revenue	3,675	3,771
Other current liabilities	7,823	7,478
Total current liabilities	23,268	21,053
Long-term debt	40,921	46,286
Deferred tax liability	1,572	1,899
Operating lease liabilities	6,971	7,481
Other long-term liabilities	2,538	2,854
Total liabilities	75,270	79,573
Commitments and contingencies - Note 13		
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; 40,485,586 and 47,152,587 shares issued and 40,485,586 and 39,407,080 shares outstanding, respectively	451	444
Additional paid-in-capital	225,583	232,357
Accumulated deficit	(133,465)	(132,386)
Accumulated other comprehensive loss	(13,868)	(13,066)
Treasury stock at cost, -0- and 7,745,507 common shares, respectively	-	(10,668)
Total stockholders' equity	78,701	76,681
Total liabilities and stockholders' equity	\$ 153,971	\$ 156,254

See accompanying notes to condensed consolidated financial statements.

HARVARD BIOSCIENCE, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited, in thousands, except per share data)

	<u>Three Months Ended June 30,</u>		<u>Six Months Ended June 30,</u>	
	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>
Revenues	\$ 29,197	\$ 23,308	\$ 56,186	\$ 47,079
Cost of revenues	12,844	9,452	24,402	20,241
Gross profit	<u>16,353</u>	<u>13,856</u>	<u>31,784</u>	<u>26,838</u>
Sales and marketing expenses	5,730	4,279	11,116	9,858
General and administrative expenses	6,399	5,670	12,732	12,429
Research and development expenses	2,701	1,897	5,188	4,387
Amortization of intangible assets	1,465	1,454	2,929	2,881
Total operating expenses	<u>16,295</u>	<u>13,300</u>	<u>31,965</u>	<u>29,555</u>
Operating income (loss)	58	556	(181)	(2,717)
Other expense:				
Interest expense	(377)	(1,233)	(788)	(2,532)
Other expense, net	(313)	(191)	(347)	(80)
Total other expense	<u>(690)</u>	<u>(1,424)</u>	<u>(1,135)</u>	<u>(2,612)</u>
Loss before income taxes	(632)	(868)	(1,316)	(5,329)
Income tax (benefit) expense	(222)	713	(237)	768
Net loss	<u>\$ (410)</u>	<u>\$ (1,581)</u>	<u>\$ (1,079)</u>	<u>\$ (6,097)</u>
Loss per share:				
Basic and diluted loss per common share	<u>\$ (0.01)</u>	<u>\$ (0.04)</u>	<u>\$ (0.03)</u>	<u>\$ (0.16)</u>
Weighted-average common shares:				
Basic and diluted	<u>40,152</u>	<u>38,468</u>	<u>39,960</u>	<u>38,389</u>

See accompanying notes to condensed consolidated financial statements.

HARVARD BIOSCIENCE, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(Unaudited, in thousands)

	<u>Three Months Ended June 30,</u>		<u>Six Months Ended June 30,</u>	
	<u>2021</u>	<u>2020</u>	<u>2021</u>	<u>2020</u>
Net loss	\$ (410)	\$ (1,581)	\$ (1,079)	\$ (6,097)
Other comprehensive income (loss):				
Foreign currency translation adjustments	523	619	(802)	(957)
Derivatives qualifying as hedges, net of tax	-	86	-	(58)
Other comprehensive income (loss)	523	705	(802)	(1,015)
	<u>\$ 113</u>	<u>\$ (876)</u>	<u>\$ (1,881)</u>	<u>\$ (7,112)</u>

See accompanying notes to consolidated financial statements

HARVARD BIOSCIENCE, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Unaudited, in thousands)

Three Months Ended June 30, 2021	Number of Shares Issued	Common Stock	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Treasury Stock	Total Stockholders' Equity
Balance at March 31, 2021	47,696	\$ 448	\$ 234,781	\$ (133,055)	\$ (14,391)	\$ (10,668)	\$ 77,115
Retirement of treasury stock	(7,746)	-	(10,668)	-	-	10,668	-
Stock option exercises	186	3	630	-	-	-	633
Stock purchase plan	56	-	202	-	-	-	202
Vesting of restricted stock units	363	-	-	-	-	-	-
Shares withheld for taxes	(69)	-	(526)	-	-	-	(526)
Stock compensation expense	-	-	1,164	-	-	-	1,164
Net loss	-	-	-	(410)	-	-	(410)
Other comprehensive income	-	-	-	-	523	-	523
Balance at June 30, 2021	<u>40,486</u>	<u>\$ 451</u>	<u>\$ 225,583</u>	<u>\$ (133,465)</u>	<u>\$ (13,868)</u>	<u>\$ -</u>	<u>\$ 78,701</u>

Three Months Ended June 30, 2020	Number of Shares Issued	Common Stock	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Treasury Stock	Total Stockholders' Equity
Balance at March 31, 2020	46,121	\$ 438	\$ 229,740	\$ (129,092)	\$ (14,409)	\$ (10,668)	\$ 76,009
Stock option exercises	7	-	19	-	-	-	19
Stock purchase plan	64	-	167	-	-	-	167
Vesting of restricted stock units	246	-	-	-	-	-	-
Shares withheld for taxes	(24)	-	(20)	-	-	-	(20)
Stock compensation expense	-	-	769	-	-	-	769
Net loss	-	-	-	(1,581)	-	-	(1,581)
Other comprehensive income	-	-	-	-	705	-	705
Balance at June 30, 2020	<u>46,414</u>	<u>\$ 438</u>	<u>\$ 230,675</u>	<u>\$ (130,673)</u>	<u>\$ (13,704)</u>	<u>\$ (10,668)</u>	<u>\$ 76,068</u>

Six Months Ended June 30, 2021	Number of Shares Issued	Common Stock	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Treasury Stock	Total Stockholders' Equity
Balance at December 31, 2020	47,153	\$ 444	232,357	\$ (132,386)	\$ (13,066)	\$ (10,668)	\$ 76,681
Retirement of treasury stock	(7,746)	-	(10,668)	-	-	10,668	-
Stock option exercises	497	7	2,550	-	-	-	2,557
Stock purchase plan	56	-	202	-	-	-	202
Vesting of restricted stock units	703	-	-	-	-	-	-
Shares withheld for taxes	(177)	-	(990)	-	-	-	(990)
Stock compensation expense	-	-	2,132	-	-	-	2,132
Net loss	-	-	-	(1,079)	-	-	(1,079)
Other comprehensive loss	-	-	-	-	(802)	-	(802)
Balance at June 30, 2021	<u>40,486</u>	<u>\$ 451</u>	<u>\$ 225,583</u>	<u>\$ (133,465)</u>	<u>\$ (13,868)</u>	<u>\$ -</u>	<u>\$ 78,701</u>

Six Months Ended June 30, 2020	Number of Shares Issued	Common Stock	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Treasury Stock	Total Stockholders' Equity
Balance at December 31, 2019	45,934	\$ 438	\$ 229,189	\$ (124,576)	\$ (12,689)	\$ (10,668)	\$ 81,694
Stock option exercises	7	-	19	-	-	-	19
Stock purchase plan	64	-	167	-	-	-	167
Vesting of restricted stock units	514	-	-	-	-	-	-
Shares withheld for taxes	(105)	-	(262)	-	-	-	(262)
Stock compensation expense	-	-	1,562	-	-	-	1,562
Net loss	-	-	-	(6,097)	-	-	(6,097)
Other comprehensive loss	-	-	-	-	(1,015)	-	(1,015)
Balance at June 30, 2020	<u>46,414</u>	<u>\$ 438</u>	<u>\$ 230,675</u>	<u>\$ (130,673)</u>	<u>\$ (13,704)</u>	<u>\$ (10,668)</u>	<u>\$ 76,068</u>

See accompanying notes to condensed consolidated financial statements.

HARVARD BIOSCIENCE, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited, in thousands)

	Six Months Ended June 30,	
	2021	2020
Cash flows from operating activities:		
Net loss	\$ (1,079)	\$ (6,097)
Adjustments to reconcile net loss to net cash provided by operating activities:		
Depreciation	891	982
Amortization of intangible assets	2,929	2,881
Amortization of deferred financing costs	140	197
Stock-based compensation expense	2,132	1,562
Deferred income taxes and other	(303)	423
Changes in operating assets and liabilities:		
Accounts receivable	323	5,855
Inventories	(2,526)	(1,374)
Other assets	(1,517)	(601)
Accounts payable and accrued expenses	1,629	1,925
Deferred revenue	(100)	(276)
Other liabilities	(714)	(233)
Net cash provided by operating activities	<u>1,805</u>	<u>5,244</u>
Cash flows from investing activities:		
Additions to property, plant and equipment	(357)	(524)
Additions to intangible assets	(150)	-
Net cash used in investing activities	<u>(507)</u>	<u>(524)</u>
Cash flows from financing activities:		
Proceeds from issuance of debt	-	6,115
Repayments of debt	(5,000)	(16,411)
Debt issuance costs	(102)	-
Proceeds from exercise of stock options	2,759	187
Taxes paid related to net share settlement of equity awards	(990)	(262)
Net cash used in financing activities	<u>(3,333)</u>	<u>(10,371)</u>
Effect of exchange rate changes on cash	(45)	(55)
Decrease in cash and cash equivalents	(2,080)	(5,706)
Cash and cash equivalents at beginning of period	8,317	8,335
Cash and cash equivalents at end of period	<u>\$ 6,237</u>	<u>\$ 2,629</u>
Supplemental disclosures of cash flow information:		
Cash paid for interest	\$ 834	\$ 2,549
Cash paid for income taxes, net of refunds	\$ 168	\$ 98

See accompanying notes to consolidated financial statements.

HARVARD BIOSCIENCE, INC.

NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS

1. Basis of Presentation and Summary of Significant Accounting Policies, and Risks and Uncertainties***Basis of Presentation and Summary of Significant Accounting Policies***

The unaudited consolidated financial statements of Harvard Bioscience, Inc. and its wholly-owned subsidiaries (collectively, Harvard Bioscience or the Company) as of June 30, 2021 and for the three and six months ended June 30, 2021 and 2020, 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, 2020 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, 2020.

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, 2021, results of operations and comprehensive income (loss) and cash flows for the three months and six months ended June 30, 2021 and 2020, as applicable, have been made. The results of operations for the three months and six months ended June 30, 2021 are not necessarily indicative of the operating results for the full fiscal year or any future periods.

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, 2020. There have been no material changes in the Company's significant accounting policies during the three and six months ended June 30, 2021.

Risks and Uncertainties

On March 11, 2020, the World Health Organization declared the outbreak of a novel coronavirus (COVID-19) as a pandemic. The COVID-19 pandemic has had a negative impact on the Company's operations to date and the future impacts of the pandemic and any resulting economic impact are largely unknown and rapidly evolving. Since the global outbreak of COVID-19, many customers, particularly academic research institutions, have reduced laboratory work which has negatively impacted, and will continue to negatively impact, the Company's sales. While many of the Company's customers, including academic labs, have reopened, a significant number of them remained closed or at significantly lower capacity levels through the second quarter of 2021. Additionally, to ensure business continuity while maintaining a safe environment for employees aligned with guidance from government and health organizations, the Company transitioned a significant portion of its workforce to work-from-home while implementing social distancing requirements and other measures to allow manufacturing and other personnel essential to production to continue work within the Company's facilities. Business travel was significantly reduced during this period. While a portion of the workforce has returned to in-office work and travel is less restricted, the Company continued to have restrictions which represent disruptions which can impact productivity including sales and marketing activities.

The global supply chain has experienced significant disruptions during the first half of 2021 due to electronic component and labor shortages and other macroeconomic factors which have emerged since the onset of COVID-19, leading to increased cost of freight and purchased materials, while also delaying customer shipments. Accordingly, these conditions in addition to the overall impact on the global economy have negatively impacted results of operations and cash flows.

2. Recently Issued Accounting Pronouncements***Accounting Pronouncements Adopted***

In December 2019, the FASB issued ASU 2019-12, Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes (ASU 2019-12), which enhances and simplifies various aspects of the income tax accounting guidance related to intra-period tax allocation, interim period accounting for enacted changes in tax law, and the year-to-date loss limitation in interim period tax accounting. ASU 2019-12 also amends other aspects of the guidance to reduce complexity in certain areas. The Company adopted the provisions of ASU 2019-12 effective on January 1, 2021. The adoption of this new accounting guidance did not have a material impact on the Company's consolidated financial statements.

Accounting Pronouncements to be Adopted

In September 2016, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2016-13, *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments (ASU 2016-13)*, which amends the impairment model by requiring entities to use a forward-looking approach based on expected losses rather than incurred losses to estimate credit losses on certain types of financial instruments, including trade receivables. This may result in the earlier recognition of allowances for losses. The FASB issued several ASUs after ASU 2016-13 to clarify implementation guidance and to provide transition relief for certain entities. ASU 2016-13 is effective for the Company for fiscal years beginning after December 15, 2022, with early adoption permitted. The Company is evaluating the impact that adopting ASU 2016-13 and related amendments will have on its consolidated financial position, results of operations and cash flows.

3. Goodwill and Intangible Assets

Goodwill

The change in the carrying amount of goodwill for the six months ended June 30, 2021 is as follows:

(in thousands)

Carrying amount at December 31, 2020	\$ 58,590
Effect of change in currency translation	(166)
Carrying amount at June 30, 2021	<u>\$ 58,424</u>

Intangible Assets

	Weighted Average Life*	June 30, 2021			December 31, 2020		
		Gross	Accumulated Amortization	Net	Gross	Accumulated Amortization	Net
Amortizable intangible assets:							
Distribution agreements/customer relationships	8.4	\$ 18,039	\$ (8,267)	\$ 9,772	\$ 18,237	\$ (7,746)	\$ 10,491
Existing technology	4.7	39,032	(22,403)	16,629	38,761	(20,674)	18,087
Trade names and patents	4.9	8,617	(4,756)	3,861	8,681	(4,362)	4,319
Total amortizable intangible assets		<u>\$ 65,688</u>	<u>\$ (35,426)</u>	<u>\$ 30,262</u>	<u>\$ 65,679</u>	<u>\$ (32,782)</u>	<u>\$ 32,897</u>
Indefinite-lived intangible assets:				248			252
Total intangible assets				<u>\$ 30,510</u>			<u>\$ 33,151</u>

* Weighted average life in years as of June 30, 2021

Intangible asset amortization expense was \$1.5 million for each of the three months ended June 30, 2021 and 2020, respectively, and was \$2.9 million for each of the six months ended June 30, 2021 and 2020, respectively. Estimated amortization expense of existing amortizable intangible assets for each of the five succeeding years and thereafter as of June 30, 2021 is as follows:

Year Ending December 31,	Amortization Expense
	(in thousands)
2021 (remainder of year)	\$ 2,923
2022	5,814
2023	5,704
2024	5,398
2025	4,280
Thereafter	6,143
Total	<u>\$ 30,262</u>

4. Balance Sheet Information

The following tables provide details of selected balance sheet items as of the periods indicated:

<i>Inventories:</i> (in thousands)	June 30, 2021	December 31, 2020
Finished goods	\$ 5,434	\$ 4,938
Work in process	3,758	3,513
Raw materials	15,517	13,811
Total	<u>\$ 24,709</u>	<u>\$ 22,262</u>

<i>Other Current Liabilities:</i> (in thousands)	June 30, 2021	December 31, 2020
Compensation	\$ 3,409	3,715
Professional fees	815	432
Warranty costs	237	185
Customer related costs	1,120	1,093
Accrued income taxes	544	286
Other	1,698	1,767
Total	<u>\$ 7,823</u>	<u>\$ 7,478</u>

5. Restructuring and Other Exit Costs

On an ongoing basis, the Company reviews the global economy, the healthcare industry, and the markets in which it competes to identify operational efficiencies, enhance commercial capabilities and align its cost base and infrastructure with customer needs and its strategic plans. In order to realize these opportunities, the Company undertakes restructuring-type activities from time to time to transform its business.

The following table summarizes the changes in the restructuring liabilities for the six months ended June 30, 2021:

(in thousands)	Severance	Other	Total
Balance at December 31, 2020	\$ 270	\$ 18	\$ 288
Restructuring and other exit costs	1,145	79	1,224
Non-cash charges	-	(41)	(41)
Cash payments	(882)	(45)	(927)
Balance at June 30, 2021	<u>\$ 533</u>	<u>\$ 11</u>	<u>\$ 544</u>

The restructuring liability has been included in other current liabilities in the consolidated balance sheet and is payable within the next twelve months. Restructuring costs were \$0.7 million for each of the three months ended June 30, 2021 and 2020, respectively, and were \$1.2 million and \$1.6 million for the six months ended June 30, 2021 and 2020, respectively. Substantially all of these restructuring costs have been included as a component of general and administrative expenses.

6. Related Party Transactions

In connection with the 2014 acquisitions of Multi Channel Systems MCS GmbH (“MCS”), the Company entered into a facility lease agreement with the former principal owner of MCS who became an employee of the Company at the time of the acquisition and subsequently retired in 2021. The MCS agreement expires on December 31, 2024. Pursuant to this lease agreement, the Company made rent payments of \$0.1 million for each of the three months ended June 30, 2021 and 2020 respectively, and \$0.2 million for each of the six months ended June 30, 2021 and 2020, respectively.

7. Leases

The Company has noncancelable operating leases for offices, manufacturing facilities, warehouse space, automobiles and equipment expiring at various dates through 2030.

The components of lease expense for the three and six months ended June 30, 2021 and 2020 are as follows:

(in thousands)	Three Months Ended June 30,		Six Months Ended June 30	
	2021	2020	2021	2020
Operating lease cost	\$ 506	\$ 544	\$ 1,023	\$ 1,079
Short term lease cost	55	43	101	85
Sublease income	(26)	(25)	(51)	(132)
Total lease cost	\$ 535	\$ 562	\$ 1,073	\$ 1,032

Supplemental cash flow information related to the Company's operating leases was as follows:

(in thousands)	Six Months Ended June 30,	
	2021	2020
Cash paid for amounts included in the measurement of lease liabilities:	\$ 1,061	\$ 1,381
Right of use assets obtained in exchange for lease obligations:	\$ 400	\$ 387

Supplemental balance sheet information related to the Company's operating leases was as follows:

(in thousands)	June 30, 2021		December 31, 2020	
Operating lease right-of use assets	\$ 7,241	\$ 7,761		
Current portion, operating lease liabilities	\$ 2,061	\$ 2,111		
Operating lease liabilities, long term	6,971	7,481		
Total operating lease liabilities	\$ 9,032	\$ 9,592		
Weighted average remaining lease term (years)		7.1		7.4
Weighted average discount rate		9.3%		9.3%

Maturities of operating lease liabilities at June 30, 2021 were as follows:

(in thousands)	
2021 (remainder of year)	\$ 1,053
2022	2,044
2023	1,999
2024	1,732
2025	1,001
Thereafter	4,854
Total lease payments	12,683
Less imputed interest	(3,651)
Total operating lease liabilities	\$ 9,032

8. Capital Stock and Stock-Based Compensation

Retirement of Treasury Stock

In May, 2021, the Company retired the 7,745,507 shares of common stock held by the Company as treasury shares and returned these shares to the status of authorized and unissued shares of common stock.

Stock-Based Payment Awards

Activity under the Company's incentive plan for the six months ended June 30, 2021 was as follows:

	Stock Options		Restricted Stock Units		Market Condition RSU's	
	Stock Options Outstanding	Weighted Average Exercise Price	Restricted Stock Units Outstanding	Grant Date Fair Value	Market Condition RSU's Outstanding	Grant Date Fair Value
Balance at December 31, 2020	2,637,339	\$ 3.51	1,560,461	\$ 2.44	813,031	2.12
Granted	-	-	793,968	4.65	293,509	4.61
Exercised	(496,792)	3.76	-	-	-	-
Vested (RSUs)	-	-	(539,417)	2.83	(163,218)	2.98
Cancelled/Forfeited	(609,310)	4.28	(56,642)	3.64	(6,179)	2.98
Performance Factor Adjustment	-	-	-	-	163,216	2.98
Balance at June 30, 2021	<u>1,531,237</u>	\$ 3.13	<u>1,758,370</u>	\$ 3.28	<u>1,100,359</u>	\$ 2.78

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, 2021 and 2020 was allocated as follows:

(in thousands)	Three Months Ended June 30,		Six Months Ended June 30,	
	2021	2020	2021	2020
Cost of revenues	\$ 31	\$ 14	\$ 51	\$ 24
Sales and marketing expenses	131	62	224	113
General and administrative expenses	969	645	1,803	1,341
Research and development expenses	33	48	54	82
Total stock-based compensation expenses	<u>\$ 1,164</u>	<u>\$ 769</u>	<u>\$ 2,132</u>	<u>\$ 1,560</u>

As of June 30, 2021, the total compensation costs related to unvested awards not yet recognized is \$7.0 million and the weighted average period over which it is expected to be recognized is approximately 2.2 years. The Company did not capitalize any stock-based compensation.

The weighted average estimated fair value of the Market Condition RSUs that were granted during the six months ended June 30, 2021 was \$4.61 per unit. The following assumptions were used to estimate the fair value of the Market Condition RSUs granted during the six months ended June 30, 2021 using a Monte-Carlo valuation simulation:

	2021
Volatility	65.1%
Risk-free interest rate	0.3%
Correlation coefficient	35.7%
Dividend yield	-%

Earnings (Loss) Per Share

Basic earnings (loss) per share is calculated by dividing net income (loss) by the number of weighted average shares of common stock outstanding during the period. The calculation of diluted earnings per share assumes conversion of stock options, restricted stock units and Market Condition RSUs 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:

(in thousands)	Three Months Ended June 30,		Six Months Ended June 30,	
	2021	2020	2021	2020
Basic	40,152	38,468	39,960	38,389
Dilutive effect of equity awards	-	-	-	-
Diluted	40,152	38,468	39,960	38,389

The Company has excluded from the shares used in calculating the diluted earnings per common share options, restricted stock units and Market Condition RSUs totaling 4,389,966 and 5,727,716 as of June 30, 2021 and 2020 respectively, as the impact of these shares would be anti-dilutive.

9. Long-Term Debt

As of June 30, 2021 and December 31, 2020, the Company's borrowings were comprised of:

(in thousands)	June 30, 2021	December 31, 2020
Long-term debt:		
Term loan	\$ 39,000	\$ 40,000
Revolving line	5,400	9,400
Less: unamortized deferred financing costs	(1,259)	(1,393)
Total debt	43,141	48,007
Less: current installments	(2,500)	(2,000)
Current unamortized deferred financing costs	280	279
Long-term debt	\$ 40,921	\$ 46,286

On December 22, 2020, the Company entered into a Credit Agreement (the "Credit Agreement") with Citizens Bank, N.A., Wells Fargo Bank, National Association, and Silicon Valley Bank (together, the "Lenders"). The Credit Agreement provides for a term loan of \$40.0 million and a \$25.0 million senior revolving credit facility (including a \$10.0 million sub-facility for the issuance of letters of credit and a \$10.0 million swingline loan sub-facility) (collectively, the "Credit Facility"). The Company's obligations under the Credit Agreement are guaranteed by certain of the Company's direct, domestic wholly-owned subsidiaries; none of the Company's direct or indirect foreign subsidiaries has guaranteed the Credit Facility. The Company's obligations under the Credit Agreement are secured by substantially all of the assets of Harvard Bioscience, Inc. and each guarantor (including all or a portion of the equity interests in certain of the Company's domestic and foreign subsidiaries). The Credit Facility matures on December 22, 2025. Issuance costs of \$1.4 million are amortized over the contractual term to maturity date on a straight-line basis, which approximates the effective interest method. As of June 30, 2021, available borrowing capacity under the revolving line of credit was \$19.6 million. The Credit Facility replaced the Company's prior credit facility with Cerberus Business Finance, LLC (the "Prior Credit Facility"), which was repaid with borrowings under the Credit Facility.

Borrowings under the Credit Facility will, at the option of the Company, bear interest at either (i) a rate per annum based on LIBOR for an interest period of one, two, three or six months, plus an applicable interest rate margin determined as provided in the Credit Agreement (a "LIBOR Loan"), or (ii) an alternative base rate plus an applicable interest rate margin, each as determined as provided in the Credit Agreement (an "ABR Loan"). LIBOR interest under the Credit Agreement is subject to applicable market rates and a floor of 0.50%. The alternative base rate is based on the Citizens Bank prime rate or the federal funds effective rate of the Federal Reserve Bank of New York and is subject to a floor of 1.0%. The applicable interest rate margin varies from 2.0% per annum to 3.25% per annum for LIBOR Loans, and from 1.5% per annum to 3.0% per annum for ABR Loans, in each case depending on the Company's consolidated leverage ratio and is determined in accordance with a pricing grid set forth in the Credit Agreement. Interest on LIBOR Loans is payable in arrears on the last day of each applicable interest period, and interest on ABR Loans is payable in arrears at the end of each calendar quarter. There are no prepayment penalties in the event the Company elects to prepay and terminate the Credit Facility prior to its scheduled maturity date, subject to LIBOR breakage and redeployment costs in certain circumstances.

As of June 30, 2021, the weighted average interest rate on the Credit Agreement borrowings was 3.0%. The effective interest rate for the three months ended June 30, 2021 and 2020 was 3.4% and 9.8%, respectively. The effective interest rate for the six months ended June 30, 2021 and 2020 was 3.3% and 9.6%, respectively.

Commencing on March 31, 2021, the outstanding term loans amortizes in quarterly installments of \$0.5 million per quarter on such date and during each of the next three quarters thereafter, \$0.75 million per quarter during the next eight quarters thereafter and \$1.0 million per quarter thereafter, with a balloon payment at maturity. Furthermore, within ninety days after the end of the Company's fiscal year ended December 31, 2021 and for each fiscal year thereafter, the term loans may be permanently reduced pursuant to certain mandatory prepayment events including an annual "excess cash flow sweep" of 50% of the consolidated excess cash flow, as defined in the agreement; provided that, in any fiscal year, any voluntary prepayments of the term loans shall be credited against the Company's "excess cash flow" prepayment obligations on a dollar-for-dollar basis for such fiscal year. Amounts outstanding under the revolving credit facility can be repaid at any time but are due in full at maturity.

The Credit Agreement includes customary affirmative, negative, and financial covenants binding on the Company. The negative covenants limit the ability of the Company, among other things, to incur debt, incur liens, make investments, sell assets and pay dividends on its capital stock. The financial covenants include a maximum consolidated net leverage ratio and a minimum consolidated fixed charge coverage ratio. The Credit Agreement also includes customary events of default.

The carrying value of the debt approximates fair value because the interest rate under the obligation approximates market rates of interest available to the Company for similar instruments.

10. Derivatives

The Company monitors interest rate risk attributable to both its outstanding and forecasted debt obligations by the use of cash flow sensitivity analysis which estimates the expected impact of changes in interest rates on the Company's future cash flows.

On January 31, 2018, the Company entered into an interest rate swap contract with a notional amount of \$36.0 million and a termination date of January 1, 2023. This swap contract, which converted specific variable-rate debt into fixed-rate debt and fixed the LIBOR rate associated with a portion of the term loan under the Prior Credit Facility at 2.72% was cancelled on December 22, 2020, in connection with the new Credit Agreement as described in Note 9. The Company structured this interest rate swaps to be fully effective in accordance with ASC 815 "Derivatives and Hedging", and therefore changes in the fair value of the swap offset the variability of cash flows associated with the variable-rate, long-term debt obligations and were reported in accumulated other comprehensive income (AOCI). These amounts subsequently were 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 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, 2020:

(in thousands)	Three Months Ended June 30, 2020	Six Months Ended June 30, 2020
Amount of loss recognized in OCT on derivatives (effective portion)	\$ (11)	\$ (227)
Amounts reclassified from accumulated other comprehensive loss to interest expense	97	169
Total	<u>\$ 86</u>	<u>\$ (58)</u>

11. Revenues

The following tables represent a disaggregation of revenue from contracts with customers for the three and six months ended June 30, 2021 and 2020:

(in thousands)	Three Months Ended June 30,		Six Months Ended June 30,	
	2021	2020	2021	2020
Instruments, equipment, software and accessories	\$ 27,992	\$ 22,069	\$ 53,819	\$ 45,006
Service, maintenance and warranty contracts	1,205	1,239	2,367	2,073
Total revenues	<u>\$ 29,197</u>	<u>\$ 23,308</u>	<u>\$ 56,186</u>	<u>\$ 47,079</u>

The following tables represent a disaggregation of revenue by geographic destination for the three and six months ended June 30, 2021 and 2020:

(in thousands)	Three Months Ended June 30,		Six Months Ended June 30,	
	2021	2020	2021	2020
United States	\$ 13,151	\$ 9,341	\$ 24,328	\$ 19,271
Europe	8,026	6,340	16,615	13,983
Asia	5,695	5,554	11,233	9,976
Rest of the world	2,325	2,073	4,010	3,849
Total revenues	<u>\$ 29,197</u>	<u>\$ 23,308</u>	<u>\$ 56,186</u>	<u>\$ 47,079</u>

No customer accounted for more than 10% of revenues for the three and six months ended June 30, 2021 and 2020.

Deferred revenue

Changes in deferred revenue from service contracts and advance payments from customers were as follows:

(in thousands)	Three Months Ended June 30, 2021		
	Service Contracts	Customer Advances	Total
Balance at March 31, 2021	\$ 1,712	\$ 1,925	\$ 3,637
Deferral of revenue	988	322	1,310
Recognition of deferred revenue	(846)	(433)	(1,279)
Effect of foreign currency translation	7	-	7
Balance at June 30, 2021	\$ 1,861	\$ 1,814	\$ 3,675

(in thousands)	Three Months Ended June 30, 2020		
	Service Contracts	Customer Advances	Total
Balance at March 31, 2020	\$ 1,410	\$ 2,263	\$ 3,673
Deferral of revenue	1,177	121	1,298
Recognition of deferred revenue	(1,144)	(145)	(1,289)
Effect of foreign currency translation	(30)	-	(30)
Balance at June 30, 2020	\$ 1,413	\$ 2,239	\$ 3,652

(in thousands)	Six Months Ended June 30, 2021		
	Service Contracts	Customer Advances	Total
Balance at December 31, 2020	\$ 1,629	\$ 2,142	\$ 3,771
Deferral of revenue	2,239	663	2,902
Recognition of deferred revenue	(2,011)	(991)	(3,002)
Effect of foreign currency translation	4	-	4
Balance at June 30, 2021	\$ 1,861	\$ 1,814	\$ 3,675

(in thousands)	Six Months Ended June 30, 2020		
	Service Contracts	Customer Advances	Total
Balance at December 31, 2019	\$ 1,587	\$ 2,362	\$ 3,949
Deferral of revenue	1,485	344	1,829
Recognition of deferred revenue	(1,643)	(467)	(2,110)
Effect of foreign currency translation	(16)	-	(16)
Balance at June 30, 2020	\$ 1,413	\$ 2,239	\$ 3,652

Allowance for Doubtful Accounts

Allowance for doubtful accounts is based on the Company's assessment of the collectability of accounts receivable. A rollforward of the allowance for doubtful accounts is as follows:

(in thousands)	Six Months Ended June 30,	
	2021	2020
Balance, beginning of period	\$ 227	\$ 325
Bad debt (credit) expense	(17)	4
Charge-offs and other recoveries	(62)	(40)
Effect of foreign currency translation	(3)	1
Balance, end of period	\$ 145	\$ 290

12. Income Tax

Income tax (benefit) expense was \$(0.2) million and \$0.7 million for the three months ended June 30, 2021 and 2020, respectively, and was \$(0.2) million and \$0.8 million for the six months ended June 30, 2021 and 2020. The effective tax rates for the three months ended June 30, 2021 and 2020, were 35.1% and (82.1)%, respectively. The effective tax rates for the six months ended June 30, 2021 and 2020, were 18.0% and (14.4)%, respectively.

The difference between the Company's effective tax rates in 2021 and 2020 compared to the U.S. statutory tax rate of 21% is primarily due to changes in valuation allowances associated with the Company's assessment of the likelihood of the recoverability of deferred tax assets. The Company currently has valuation allowances against substantially all of its net operating loss carryforwards and tax credit carryforwards.

13. Commitments and Contingent Liabilities

On April 14, 2017, representatives for the estate of an individual plaintiff filed a wrongful death complaint with the Suffolk Superior Court, in the County of Suffolk, Massachusetts (the "Court"), against the Company and other defendants, including Biostage, Inc. (f/k/a Harvard Apparatus Regenerative Technology, Inc.) ("Biostage"), a former subsidiary of the Company that was spun off in 2013, as well as another third party. The complaint seeks payment for an unspecified amount of damages and alleges that the plaintiff sustained terminal injuries allegedly caused by products, including one synthetic trachea scaffold and two bioreactors, provided by certain of the named defendants and utilized in connection with surgeries performed by third parties in Europe in 2012 and 2013.

On October 1, 2019, the Court entered an order granting plaintiffs' motion to compel the defendant to produce discovery. Subsequently, the plaintiffs filed a motion for sanctions against the Company on January 6, 2020 claiming failure to produce. The Company's counsel at the time, which had been selected for the case by the Company's liability insurance carrier, never notified the Company of plaintiffs' motion and never responded to plaintiff's motion. As a result of the failure of our former counsel to respond, on January 29, 2020, the Court entered an order allowing plaintiffs' sanctions against the Company and the other defendants, which establishes a sanction of admitted liability. In June 2021, the Company was informed of these 2019 and 2020 court actions by new defense counsel appointed by the Company's liability insurance carrier. On June 9, 2021, the Company, together with the other defendants, filed a motion to vacate the Court's order allowing plaintiffs' motion for sanctions. On August 3, 2021, the Court held a hearing on the defendants' motion to vacate but no ruling has been made. The Company continues to actively fight the damages in this case.

While the Company believes that claims made in this lawsuit are without merit and that there are strong grounds to vacate the sanctions, unless the sanctions award is vacated the Company could face a trial on damages. If the sanctions award is vacated, the Company will have the opportunity to contest the underlying claims at trial and, while there can be no assurance of prevailing, the Company believes those claims lack merit. If the Company faces a trial on damages, whether as a result of the sanctions or following a loss on the merits, the Company does not know the exact amount of compensatory and, potentially, punitive damages that could be awarded. In all events, the Company believes that available product liability insurance coverage will be available for all or a significant portion of such damages, although there can be no assurance that the damages awarded will be within the limits of the insurance. The Company is also evaluating possible malpractice claims as an additional source of recovery. The Company cannot provide assurance that any losses will not exceed such recoveries. Further, Biostage has agreed to indemnify us for claims and losses relating to certain liabilities that it has assumed from us, including liabilities in connection with the sale of Biostage's products and other liabilities related to the operation of Biostage's business. However, the Company cannot be assured that Biostage will have the ability to indemnify the Company against the liabilities the Company may incur in this lawsuit, in particular due to Biostage having limited revenues, products in early-stage development, a need for additional funds in the future and its overall financial condition.

The Company is involved in various other claims and legal proceedings arising in the ordinary course of business. After consultation with legal counsel, the Company has determined that the ultimate disposition of such proceedings is not likely to have a material adverse effect on its business, financial condition, results of operations or cash flows. Although unfavorable outcomes in the proceedings are possible, the Company has not accrued for loss contingencies relating to any such matters as they are not considered to be probable and reasonably estimable. If one or more of these matters are resolved in a manner adverse to the Company, the impact on the Company's business, financial condition, results of operations and cash flows could be material.

Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations.**Forward-Looking Statements**

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 the duration and severity of the COVID-19 pandemic and its impact on our business; reductions in customers’ research budgets or government funding; domestic and global economic conditions; economic, political and other risks associated with international revenues and operations; recently enacted U.S. government tax reform; 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 inability to manage our growth; competition from our competitors; our substantial debt and our ability to meet the financial covenants contained in our credit facility; failure or inadequacy of the our information technology structure; impact of difficulties implementing our enterprise resource planning systems; information security incidents or cybersecurity breaches; 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 our current and any future restructuring initiatives; failure of any banking institution in which we deposit our funds or its failure to provide services; our failure to raise or generate capital necessary to implement our acquisition and expansion strategy; 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 of 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 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 year ended December 31, 2020, 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.

Unless the context requires otherwise, references in this Quarterly Report to “we,” “us” and “our” refer to Harvard Bioscience, Inc., and its subsidiaries.

Overview

Harvard Bioscience, Inc. is a leading developer, manufacturer and seller of technologies, products and services that enable fundamental research, discovery, and preclinical testing for drug development. Our customers range from renowned academic institutions and government laboratories to the world's leading pharmaceutical, biotechnology and contract research organizations. With operations in North America, Europe, and China, we sell through a combination of direct and distribution channels to customers around the world.

Recent Developments

COVID-19

On March 11, 2020, the World Health Organization declared the outbreak of a novel coronavirus (COVID-19) as a pandemic. The COVID-19 pandemic has had a negative impact on our operations to date and the future impacts of the pandemic and any resulting economic impact remain unknown and rapidly evolving. Since the global outbreak of COVID-19, many customers, particularly academic research institutions, reduced laboratory work which has negatively impacted, and will continue to negatively impact, our sales. While many of our customers, including academic labs, have reopened, a significant number of them remained closed or at significantly lower capacity levels through the second quarter of 2021. Additionally, to ensure business continuity while maintaining a safe environment for employees aligned with guidance from government and health organizations, we transitioned a significant portion of our workforce to work-from-home while implementing social distancing requirements and other measures to allow manufacturing and other personnel essential to production to continue work within our facilities. Business travel was significantly reduced during this period. While a portion of the workforce has returned to in-office work and travel is less restricted, we continue to have restrictions which represent disruptions which can impact productivity including sales and marketing activities.

The global supply chain has experienced significant disruptions during the first half of 2021 due to electronic component and labor shortages and other macroeconomic factors, leading to increased cost of freight and purchased materials, while also delaying customer shipments. We believe these supply chain trends will continue through the rest of 2021.

These conditions in addition to the overall impact on the global economy has negatively impacted our results of operations and cash flows.

Revenue for the three and six months ended June 30, 2021 and for the year ending December 31, 2020 was negatively impacted due to the conditions noted. If business interruptions resulting from COVID-19 were to be prolonged or expanded in scope, our business, financial condition, results of operations and cash flows would be negatively impacted. We will continue to actively monitor this situation and will implement actions necessary to maintain business continuity.

Restructuring Plan

In December 2019, we implemented a restructuring plan (the "2019 Restructuring Plan") to deliver significant cost savings beginning in 2020 and support delivery of a strategic action plan announced in September 2019. The 2019 Restructuring Plan includes consolidation of our Connecticut manufacturing plant with our existing Massachusetts site, downsizing of operations in the United Kingdom and a reduction in force across the business equal to approximately 10% of our headcount. The 2019 Restructuring Plan is expected to deliver approximately \$4.5 million of annualized run-rate savings. The original initiatives under the 2019 Restructuring Plan were completed in the second half of 2020.

We continued to execute the 2019 Restructuring Plan during the COVID-19 pandemic and expanded the scope of the restructuring by realigning our organizational structure to reduce management layers and accelerated our efforts to move to a leaner organization and operation. As a result of this expanded scope, we eliminated additional headcount during 2020 and in the first quarter of 2021 communicated to employees our plan to consolidate certain engineering operations and eliminate two small facilities in Europe. These incremental actions are expected to generate additional annualized cost savings of approximately \$2.0 million, and were substantially complete as of June 30, 2021.

Through June 30, 2021, we incurred cash outlays of \$8.2 million as a result of the actions taken under the 2019 Restructuring Plan and incremental cost reductions and other business improvements. We believe these strategic actions will position the business for improved financial performance.

Selected Results of Operations**Three months ended June 30, 2021 compared to three months ended June 30, 2020**

(dollars in thousands)	Three Months Ended June 30,			
	2021	% of revenue	2020	% of revenue
Revenues	\$ 29,197		\$ 23,308	
Gross profit	16,353	56.0%	13,856	59.4%
Sales and marketing expenses	5,730	19.6%	4,279	18.4%
General and administrative expenses	6,399	21.9%	5,670	24.3%
Research and development expenses	2,701	9.3%	1,897	8.1%
Amortization of intangible assets	1,465	5.0%	1,454	6.2%
Interest expense	377	1.3%	1,233	5.3%
Income tax (benefit) expense	(222)	-0.8%	713	3.1%

Revenues

Revenues for the three months ended June 30, 2021 were \$29.2 million, an increase of approximately \$5.9 million, or 25.3%, compared to revenues of \$23.3 million for the three months ended June 30, 2020. Revenue improved significantly due to academic labs reopening in 2021. A large number of academic labs remained closed during the second quarter of 2020. We believe that academic lab activity has not yet returned to pre-COVID levels, but activity is significantly higher than the prior year period. Revenue also increased due to improved sales of products from our preclinical product family associated with improved sales processes and product enhancements released in 2020.

Gross profit

Gross profit increased \$2.5 million, or 18.0%, to \$16.4 million for the three months ended June 30 2021, compared with \$13.9 million for the three months ended June 30, 2020, due primarily to the increase in revenue noted. Gross margin decreased to 56.0% for the three months ended June 30, 2021 compared with 59.4% for the three months ended June 30, 2020. The decrease in gross margin was due to higher supply chain and logistics costs. The global supply chain has experienced significant disruptions during the first half of 2021 due to electronic component and labor shortages and other macroeconomic factors, leading to increased cost of freight and purchased materials. We believe these supply chain trends will continue through the rest of 2021.

Sales and marketing expenses

Sales and marketing expenses increased \$1.4 million, or 33.9%, to \$5.7 million for the three months ended June 30 2021 compared to \$4.3 million during the same period in 2020. The increase was primarily due to investments in new marketing and sales support personnel and higher costs as many of our employees returned from part-time to full-time status. During the second quarter of 2020 part-time work, pay reductions and other temporary cost reduction measures were in place in response to the rapid reduction of revenue following the onset of COVID-19.

General and administrative expenses

General and administrative expenses were \$6.4 million for the three months ended June 30, 2021, an increase of \$0.7 million, or 12.9%, compared with \$5.7 million for the three months ended June 30, 2020. The increase was due to higher overall compensation as many of our employees returned from part-time to full-time status and higher stock-based compensation. During the second quarter of 2020 part-time work, pay reductions and other temporary cost reduction measures were in place in response to the rapid reduction of revenue following the onset of COVID-19.

Research and development expenses

Research and development expenses were \$2.7 million for the three months ended June 30, 2021, an increase of \$0.8 million, or 42.4%, compared with \$1.9 million for the three months ended June 30, 2020. The increase was due to higher compensation as many of our employees returned from part-time to full-time status and higher stock-based compensation and other costs to affect our strategic plans. During the second quarter of 2020 part-time work, pay reductions and other temporary cost reduction measures were in place in response to the rapid reduction of revenue following the onset of COVID-19.

Amortization of intangible assets

Amortization of intangible asset expenses was \$1.5 million for the three months ended June 30, 2021 and did not change materially as compared to the three months ended June 30, 2020.

Interest expense

Interest expense was \$0.4 million for the three months ended June 30, 2021, a decrease of \$0.8 million, or 69.4%, compared with \$1.2 million for the three months ended June 30, 2020. The decrease was due to lower interest rates under our new Credit Agreement entered into on December 22, 2020, as well as reduced average borrowing as compared to the prior period.

Income tax (benefit) expense

Income tax (benefit) expense for the three months ended June 30, 2021 and 2020 was \$(0.2) million and \$0.7 million, respectively. The effective tax rates for the three months ended June 30, 2021 and 2020 were 35.1% and (82.1)%, respectively. The difference between our effective tax rates in 2021 and 2020 compared to the U.S. statutory tax rate of 21% is primarily due to changes in valuation allowances associated with our assessment of the likelihood of the recoverability of our deferred tax assets. We currently have valuation allowances against substantially all of our net operating loss carryforwards and tax credit carryforwards.

Six months ended June 30, 2021 compared to six months ended June 30, 2020

(dollars in thousands)	Six Months Ended June 30,			
	2021	% of revenue	2020	% of revenue
Revenues	\$ 56,186		\$ 47,079	
Gross profit	31,784	56.6%	26,838	57.0%
Sales and marketing expenses	11,116	19.8%	9,858	20.9%
General and administrative expenses	12,732	22.7%	12,429	26.4%
Research and development expenses	5,188	9.2%	4,387	9.3%
Amortization of intangible assets	2,929	5.2%	2,881	6.1%
Interest expense	788	1.4%	2,532	5.4%
Income tax (benefit) expense	(237)	-0.4%	768	1.6%

Revenues

Revenues for the six months ended June 30, 2021 were \$56.2 million, an increase of approximately \$9.1 million, or 19.3%, compared to revenues of \$47.1 million for the six months ended June 30, 2020. Revenue improved significantly due to academic labs reopening in 2021. A large number of academic labs remained closed during 2020. We believe that academic lab activity has not yet returned to pre-COVID levels, but activity is significantly higher than prior year. Revenue also increased due to improved sales of products from our preclinical product family associated with improved sales processes and product enhancements released in 2020.

Gross profit

Gross profit increased \$4.9 million, or 18.4%, to \$31.8 million for the six months ended June 30 2021, compared with \$26.9 million for the six months ended June 30, 2020, due primarily to the increase in revenue noted. Gross margin decreased to 56.6% for the six months ended June 30, 2021 compared with 57.0% for the six months ended June 30, 2020. The decrease in gross margin on a year-to-date date was due to supply chain cost increases in the second quarter of 2021 which were offset by gross margin increases due to higher volumes and improved product mix.

Sales and marketing expenses

Sales and marketing expenses increased \$1.2 million, or 12.8%, to \$11.1 million for the six months ended June 30 2021 compared to \$9.9 million during the same period in 2020. The increase was primarily due to investments in new marketing and sales support personnel, higher costs as many of our employees returned from part-time to full-time status and higher variable sales costs offset by cost reduction initiatives and lower travel and trade show related costs due to COVID-19-related restrictions.

General and administrative expenses

General and administrative expenses were \$12.7 million for the six months ended June 30, 2021, an increase of \$0.3 million, or 2.4%, compared with \$12.4 million for the six months ended June 30, 2020. The increase was due to higher compensation costs as many of our employees returned from part-time to full-time status and higher stock-based compensation which were partially offset by cost reduction initiatives and lower restructuring and other costs to affect our strategic plans.

Research and development expenses

Research and development expenses were \$5.2 million for the six months ended June 30, 2021, an increase of \$0.8 million, or 18.3%, compared with \$4.4 million for the six months ended June 30, 2020. The increase was due to higher compensation costs as many of our employees returned from part-time to full-time status and higher restructuring and other costs to affect our strategic plans.

Amortization of intangible assets

Amortization of intangible asset expenses was \$2.9 million for the six months ended June 30, 2021 and did not change materially as compared to the six months ended June 30, 2021.

Interest expense

Interest expense was \$0.8 million for the six months ended June 30, 2021, a decrease of \$1.7 million, or 68.9%, compared with \$2.5 million for the six months ended June 30, 2020. The decrease was due to lower interest rates under our new Credit Agreement entered into on December 22, 2020, as well as reduced average borrowing as compared to the prior period.

Income tax (benefit) expense

Income tax (benefit) expense for the six months ended June 30, 2021 and 2020 was \$(0.2) million and \$0.8 million, respectively. The effective tax rates for the six months ended June 31, 2021 and 2020 were 18.0% and (14.4)%, respectively. The difference between our effective tax rates in 2021 and 2020 compared to the U.S. statutory tax rate of 21% is primarily due to changes in valuation allowances associated with our assessment of the likelihood of the recoverability of our deferred tax assets. We currently have valuation allowances against substantially all of our net operating loss carryforwards and tax credit carryforwards.

Liquidity and Capital Resources

Our primary sources of liquidity are cash and cash equivalents, internally generated cash flow from operations and our revolving credit facility. Our expected cash outlays relate primarily to cash payments due under our Credit Agreement described below as well as capital expenditures, severance and other payments associated with ongoing restructuring and cost reduction initiatives.

As of June 30, 2021, we held cash and cash equivalents of \$6.2 million, compared with \$8.3 million at December 31, 2020. As of June 30, 2021 and December 31, 2020, we had \$44.4 million and \$49.4 million of borrowings outstanding under our Credit Facility, respectively. Total debt, net of cash and cash equivalents, was \$38.2 million at June, 2021, compared to \$41.1 million at December 31, 2020.

On December 22, 2020, we entered into the Credit Facility which provides for a term loan of \$40.0 million and a \$25.0 million senior revolving credit facility. Obligations under the Credit Agreement are secured by substantially all of our assets and are guaranteed by certain of our direct, domestic wholly-owned subsidiaries. The Credit Agreement matures on December 22, 2025. See Note 9 to the Consolidated Financial Statements for a detailed discussion regarding our Credit Agreement.

As of June 30, 2021, the interest rate on our borrowings was 3.0%, and our available borrowing capacity under the revolving line of credit was \$19.6 million. We are compliant with all covenants under the Credit Agreement as of June 30, 2021.

Based on our 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 costs associated with restructuring activities and capital expenditures for at least the next 12 months. This assessment includes consideration of our best estimates of the impact of the COVID-19 pandemic on our financial results described above. 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.

CONDENSED CONSOLIDATED CASH FLOW STATEMENTS

(in thousands)	Six Months Ended June 30,	
	2021	2020
Cash provided by operating activities	\$ 1,805	\$ 5,244
Cash used in investing activities	(507)	(524)
Cash used in financing activities	(3,333)	(10,371)
Effect of exchange rate changes on cash	(45)	(55)
Decrease in cash and cash equivalents	<u>\$ (2,080)</u>	<u>\$ (5,706)</u>

Cash provided by operations was \$1.8 million and \$5.2 million for the six months ended June 30, 2021 and 2020, respectively. Cash flow from operations for the six months ended June 30, 2021, was lower than the prior year period due to variable compensation paid in 2021 and higher levels of working capital due to sales growth. Cash flow from operations for the six months ended June 30, 2020 was positively impacted by reductions in working capital due to lower revenue and management efforts to offset the initial significant negative impacts that the COVID-19 pandemic had on revenue.

Cash used in investing activities was \$0.5 million for each of the six months ended June 30, 2021 and 2020, respectively, primarily consisting of capital expenditures.

Cash used in financing activities was \$3.3 million and \$10.3 million for the six months ended June 30, 2021 and 2020, respectively. During the six months ended June 30, 2021, we repaid \$5.0 million of debt, which included a term loan installment payment of \$1.0 million and paydown of debt under our revolving facility of \$4.0 million, we received proceeds of \$2.8 million from the exercise of stock options and we paid \$1.0 million for taxes related to net share settlement of equity awards. During the six months ended June 30, 2020, we repaid \$10.3 million of debt, which included a term loan installment payment of \$1.6 million, and an excess cash flow payment of \$4.0 million.

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, the euro, the Canadian dollar and the Swedish krona.

During the three months ended June 30, 2021, changes in foreign currency exchange rates resulted in a favorable translation effect on our consolidated revenues of approximately \$1.0 million and an unfavorable effect on expenses of approximately \$0.9 million. During the six months ended June 30, 2021, changes in foreign currency exchange rates resulted in a favorable translation effect on our consolidated revenues of approximately \$1.8 million and an unfavorable effect on expenses of approximately \$1.7 million.

The gain associated with the translation of foreign equity into U.S. dollars included as a component of comprehensive income (loss) during the three months ended June 30 2021 was approximately \$0.5 million, compared to a gain of \$0.7 million for the three months ended June 31, 2020. The loss associated with the translation of foreign equity into U.S. dollars included as a component of comprehensive income (loss) during the six months ended June 31, 2021 was approximately \$(0.8) million, compared to a loss of \$(1.0) million for the six months ended June 30, 2020.

In addition, currency exchange rate fluctuations included as a component of net income resulted in currency gains (losses) of approximately \$(0.2) million and \$(0.1) million during each of the three months ended June 30, 2021 and 2020, and currency gains (losses) of \$(0.1) million and \$0.1 million during each of the six months ended June 30, 2021 and 2020, respectively.

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, 2020.

Recently Issued Accounting Pronouncements

For information on recent accounting pronouncements impacting our business, see “Recently Issued Accounting Pronouncements” included in Note 2 to our Consolidated Financial Statements included in “Part I, Item 1. Financial Statement” of this report.

Item 3. Quantitative and Qualitative Disclosures about Market Risk.

Not applicable.

Item 4. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

As of June 30, 2021, the end of the period covered by this report, our management, including our Chief Executive Officer and our Chief Financial Officer, reviewed and evaluated the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) or 15d-15(e) of the Exchange Act). Based upon management's review and evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of the end of the period covered by this Quarterly Report on Form 10-Q, our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed in our Exchange Act reports is recorded, processed, summarized and reported within the time periods specified by the SEC and is accumulated and communicated to management, including the Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during the second quarter of fiscal 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. We continue to monitor the impact of the COVID-19 pandemic and, despite many of our employees working remotely, have not experienced any changes that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Effectiveness of Controls and Procedures

In designing and evaluating our controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud within the Company have been detected.

PART II. OTHER INFORMATION

Item 1 Legal Proceedings.

The information included in Note 13 to the Condensed Consolidated Financial Statements (Unaudited) included in Part I, Item 1 of this quarterly report is incorporated herein by reference.

Item 1A. Risk Factors.

You should carefully consider the risk factors set forth below together with the risk factors discussed in Part I, “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, which could materially affect our business, financial position, or future results of operations. The risks described below and in our Annual Report on Form 10-K are not the only risks we face. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also materially adversely affect our business, financial position, or future results of operations.

As a result of our spin-off of Harvard Apparatus Regenerative Technology, Inc., now known as Biostage, together with certain related transactions, third parties may seek to hold us responsible for Biostage’s liabilities, including liabilities that Biostage has assumed from us.

Third parties may continue to seek to hold us responsible for Biostage’s liabilities, including any of the liabilities that Biostage agreed to retain or assume in connection with the separation of the Biostage business from our businesses, and related spin-off distribution. On April 14, 2017, representatives for the estate of an individual plaintiff filed a wrongful death complaint with the Suffolk Superior Court, in the County of Suffolk, Massachusetts, against us and other defendants, including Biostage, as well as another third party. The complaint seeks payment for an unspecified amount of damages and alleges that the plaintiff sustained terminal injuries allegedly caused by products, including one synthetic trachea scaffold and two bioreactors, provided by certain of the named defendants and utilized in connection with surgeries performed by third parties in Europe in 2012 and 2013.

On October 1, 2019, the Court entered an order granting plaintiffs’ motion to compel the defendant to produce discovery. Subsequently, the plaintiffs filed a motion for sanctions against us on January 6, 2020 claiming failure to produce. Our counsel at the time, which had been selected for the case by our liability insurance carrier, never notified us of plaintiffs’ motion and never responded to plaintiffs’ motion. As a result of the failure of our former counsel to respond, on January 29, 2020, the Court entered an order allowing plaintiffs’ sanctions against us and the other defendants, which establishes a sanction of admitted liability. In June 2021, we were informed of these 2019 and 2020 court actions by new defense counsel appointed by our liability insurance carrier. On June 9, 2021, we, together with the other defendants, filed a motion to vacate the Court’s order allowing plaintiffs’ motion for sanctions. On August 3, 2021, the Court held a hearing on the defendants’ motion to vacate but no ruling on the motion has been made. We continue to actively fight the damages in this case.

While we believe that claims made in this lawsuit are without merit and that there are strong grounds to vacate the sanctions, unless the sanctions award is vacated, we could face a trial on damages. If the sanctions award is vacated, we will have the opportunity to contest the underlying claims at trial and, while there can be no assurance of prevailing, we believe those claims lack merit. If we face a trial on damages, whether as a result of the sanctions or following a loss on the merits, we do not know the exact amount of compensatory and, potentially, punitive damages that could be awarded. In all events, we believe that available product liability insurance coverage will be available for all or a significant portion of such damages, although there can be no assurance that the damages awarded will be within the limits of the insurance. We are also evaluating possible malpractice claims as an additional source of recovery. We cannot provide assurance that any losses will not exceed such recoveries. Further, while Biostage has agreed to indemnify us for claims and losses relating to certain liabilities that it has assumed from us, including liabilities in connection with the sale of Biostage’s products and other liabilities related to the operation of Biostage’s business, we cannot assure you that Biostage will have the ability to indemnify us against the liabilities we may incur in this lawsuit, in particular due to Biostage having limited revenues, products in early-stage development, a need for additional funds in the future and its overall financial condition. If Biostage is unable to satisfy its obligations under its indemnity to us, we may have to satisfy the liabilities in this lawsuit, which could have an adverse impact on our financial condition, results of operations or cash flows.

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

There were no unregistered sales of equity securities during the period covered by this report.

Item 3. Defaults Upon Senior Securities.

None.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

None.

Item 6. Exhibits

- [10.1](#) [Harvard Bioscience, Inc. 2021 Incentive Plan \(previously filed as an exhibit to the Company's Current Report on Form 8-K \(filed May 19, 2021\) and incorporated by reference thereto\).](#)
- [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.](#)
- [32.2*](#) [Certification of Chief Executive 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.](#)
- 101.INS Inline XBRL Instance Document
- 101.SCH Inline XBRL Taxonomy Extension Schema Document
- 101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase Document
- 101.DEF Inline XBRL Taxonomy Extension Definition Linkbase Document
- 101.LAB Inline XBRL Taxonomy Extension Labels Linkbase Document
- 101.PRE Inline XBRL Taxonomy Extension Presentation Linkbase Document
- 104 Cover Page Interactive Data File (formatted in Inline XBRL and contained in Exhibit 101)
- * 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.

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 6, 2021

HARVARD BIOSCIENCE, INC.

By: /s/ JAMES GREEN
 James Green
 Chief Executive Officer

By: /s/ MICHAEL A. ROSSI
 Michael A. Rossi
 Chief Financial Officer

Certification

I, Michael A. Rossi, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Harvard Bioscience, Inc.
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)), and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 6, 2021

/s/ MICHAEL A. ROSSI

Michael A. Rossi
Chief Financial Officer

Certification

I, James Green, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Harvard Bioscience, Inc.
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)), and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 6, 2021

/s/ JAMES GREEN

James Green
Chief Executive Officer

CERTIFICATION OF PERIODIC FINANCIAL REPORT

PURSUANT TO 18 U.S.C. SECTION 1350

The undersigned officer of Harvard Bioscience, Inc. (the "Company") hereby certifies to his knowledge that the Company's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2021 (the "Report") to which this certification is being furnished as an exhibit, as filed with the Securities and Exchange Commission on the date hereof, fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company. This certification is provided solely pursuant to 18 U.S.C. Section 1350 and Item 601(b)(32) of Regulation S-K (Item 601(b)(32)) promulgated under the Securities Act of 1933, as amended (the "Securities Act"), and the Exchange Act. In accordance with clause (ii) of Item 601(b)(32), this certification (A) shall not be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section, and (B) shall not be deemed to be incorporated by reference into any filing under the Securities Act or the Exchange Act, except to the extent that the Company specifically incorporates it by reference.

Date: August 6, 2021

/s/ MICHAEL A. ROSSI

Name: Michael A. Rossi
Title: Chief Financial Officer

CERTIFICATION OF PERIODIC FINANCIAL REPORT

PURSUANT TO 18 U.S.C. SECTION 1350

The undersigned officer of Harvard Bioscience, Inc. (the "Company") hereby certifies to his knowledge that the Company's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2021 (the "Report") to which this certification is being furnished as an exhibit, as filed with the Securities and Exchange Commission on the date hereof, fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and that the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company. This certification is provided solely pursuant to 18 U.S.C. Section 1350 and Item 601(b)(32) of Regulation S-K (Item 601(b)(32)) promulgated under the Securities Act of 1933, as amended (the "Securities Act"), and the Exchange Act. In accordance with clause (ii) of Item 601(b)(32), this certification (A) shall not be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section, and (B) shall not be deemed to be incorporated by reference into any filing under the Securities Act or the Exchange Act, except to the extent that the Company specifically incorporates it by reference.

Date: August 6, 2021

/s/ JAMES GREEN

Name: James Green
Title: Chief Executive Officer