UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

Mark one

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

For the quarterly period ended October 31, 2019

or

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

For the transition period from _____ to _____

Commission File Number 001-09974

ENZO BIOCHEM, INC.

(Exact name of registrant as specified in its charter)

New York	13-2866202
(State or Other Jurisdiction of Incorporation or Organization)	(IRS. Employer Identification No.)
527 Madison Ave, New York, New York	10022
(Address of Principal Executive office)	(Zip Code)

212-583-0100
(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 has 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 45 of Regulation S-T (§232.405 of that chapter) during the preceding 12 months (or such shorter period that the registrant was required to submit and post such files).

Yes ☒ No ☐

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common stock $0.01 par	ENZ	New York Stock Exchange

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 (as defined in Rule 12b-2 of the Exchange Act).

Large accelerated filer ☐ Accelerated filer ☒
Non-accelerated filer ☐ (Do not check if smaller reporting company) 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.
Yes ☐ No ☐

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 December 2, 2019, the Registrant had 47,556,807 shares of common stock outstanding.

ENZO BIOCHEM, INC.
FORM 10-Q
October 31, 2019

INDEX

ENZO BIOCHEM, INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except share data)

	October 31, 2019 (unaudited)	July 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 56,893	$ 60,146
Accounts receivable, net	9,877	10,738
Inventories	7,568	7,842
Prepaid expenses and other	2,956	2,727
Total current assets	77,294	81,453
Property, plant and equipment, net	13,945	14,254
Right-of-use assets	23,201	—
Goodwill	7,452	7,452
Intangible assets, net	892	1,032
Other assets, including restricted cash of $750	2,452	2,449
Total assets	$ 125,236	$ 106,640
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable – trade	$ 8,630	$ 7,256
Accrued liabilities	9,379	8,362
Other current liabilities	138	391
Finance leases short term	254	—
Current portion of operating lease liabilities	4,598	—
Total current liabilities	22,999	16,009
Long term debt – net	4,175	4,179
Operating lease liabilities, non-current	19,382	—
Other liabilities and finance leases long term	352	424
Total liabilities	46,908	20,612
Commitments and contingencies		
Stockholders' equity:		
Preferred Stock, $.01 par value; authorized 25,000,000 shares; no shares issued or outstanding	—	—
Common Stock, $.01 par value; authorized 75,000,000 shares; shares issued and outstanding: 47,556,807 at October 31, 2019 and 47,556,807 at July 31, 2019	476	476
Additional paid-in capital	332,923	332,704
Accumulated deficit	(257,380)	(249,732)
Accumulated other comprehensive income	2,309	2,580
Total stockholders' equity	78,328	86,028
Total liabilities and stockholders' equity	$ 125,236	$ 106,640

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

ENZO BIOCHEM, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(UNAUDITED)
(in thousands, except per share data)

	Three Months Ended October 31,	
	2019	**2018**
Revenues	$ 20,207	$ 21,260
Operating costs and expenses:		
Cost of revenues	14,521	14,239
Research and development	1,054	728
Selling, general and administrative	11,139	10,970
Legal and related expenses	1,696	1,301
Total operating costs and expenses	28,410	27,238
Operating loss	(8,203)	(5,978)
Other income (expense):		
Interest	237	274
Other	127	47
Foreign exchange gain (loss)	191	(324)
Loss before income taxes	(7,648)	(5,981)
Benefit for income taxes	—	—
Net loss	$ (7,648)	$ (5,981)
Net loss per common share:		
Basic and diluted	$ (0.16)	$ (0.13)
Weighted average common shares outstanding:		
Basic and diluted	47,557	47,186

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

ENZO BIOCHEM, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(UNAUDITED)
(in thousands)

	Three Months Ended October 31,	
	2019	**2018**
Net loss	$ (7,648)	$ (5,981)
Other comprehensive income (loss):		
Foreign currency translation adjustments	(271)	270
Comprehensive loss	$ (7,919)	$ (5,711)

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

ENZO BIOCHEM, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
Three Months Ended October 31, 2019 and 2018
(UNAUDITED)
(in thousands, except share data)

	Common Stock Shares Issued	Common Stock Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Total Stockholders' Equity
Balance at July 31, 2019	*47,556,807*	$ 476	$ 332,704	$ (249,732)	$ 2,580	$ 86,028
Net loss for the period ended October 31, 2019	—	—	—	(7,648)	—	(7,648)
Share-based compensation charges	—	—	219	—	—	219
Foreign currency translation adjustments	—	—	—	—	(271)	(271)
Balance at October 31, 2019	*47,556,807*	$ 476	$ 332,923	$ (257,380)	$ 2,309	$ 78,328

	Common Stock Shares Issued	Common Stock Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income	Total Stockholders' Equity
Balance at July 31, 2018	*47,182,254*	$ 472	$ 330,770	$ (252,221)	$ 2,100	$ 81,121
Net loss for the period ended October 31, 2018	—	—	—	(5,981)	—	(5,981)
Exercise of stock options	*10,000*	—	25	—	—	25
Share-based compensation charges	—	—	235	—	—	235
Vesting of restricted stock	*175*	—	—	—	—	175
Foreign currency translation adjustments	—	—	—	—	270	270
Balance at October 31, 2018	*47,192,429*	$ 472	$ 331,030	$ (258,202)	$ 2,370	$ 75,670

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

ENZO BIOCHEM, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(UNAUDITED)
(in thousands)

	Three Months Ended October 31,	
	2019	**2018**
Cash flows from operating activities:		
Net loss	$ (7,648)	$ (5,981)
Adjustments to reconcile net loss to net cash provided by(used in) operating activities:		
Depreciation and amortization of property, plant and equipment	579	519
Amortization of intangible assets	146	247
Share-based compensation charges	219	235
Accrual for share-based 401(k) employer match expense	207	196
Foreign exchange (gain) loss	(217)	302
Changes in operating assets and liabilities:		
Accounts receivable	890	312
Inventories	310	(309)
Prepaid expenses and other assets	517	449
Accounts payable – trade	1,325	(2,361)
Accrued liabilities, other current liabilities and other liabilities	1,606	187
Total adjustments	5,582	(223)
Net cash used in operating activities	(2,066)	(6,204)
Cash flows from investing activities:		
Capital expenditures	(274)	(406)
Security deposits and other	—	(609)
Net cash used in investing activities	(274)	(1,015)
Cash flows from financing activities:		
Repayments under mortgage agreement and finance leases	(105)	(59)
Cost to obtain loan	(66)	—
Proceeds from exercise of stock options	—	25
Net cash used in financing activities	(171)	(34)
Effect of exchange rate changes on cash and cash equivalents	8	(11)
Decrease in cash and cash equivalents	(2,503)	(7,264)
Cash and cash equivalents - beginning of period	60,146	60,041
Cash and cash equivalents - end of period	$ 57,643	$ 52,777
The composition of cash and cash equivalents and restricted cash is as follows:		
Cash and cash equivalents	56,893	52,777
Restricted cash included in other assets	750	—
Total cash and cash equivalents (including restricted cash)	$ 57,643	$ 52,777

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

Note 1 – Basis of Presentation

The accompanying consolidated financial statements include the accounts of Enzo Biochem, Inc. and its wholly-owned subsidiaries, Enzo Life Sciences, Enzo Clinical Labs, Enzo Therapeutics, Enzo Realty LLC and Enzo Realty II LLC, collectively or with one or more of its subsidiaries referred to as the "Company" or "Companies". The consolidated balance sheet as of October 31, 2019, the consolidated statements of operations and comprehensive income (loss) for the three months ended October 31, 2019 and 2018, the consolidated statements of cash flows for the three months ended October 31, 2019 and 2018 and the consolidated statement of stockholders' equity for the three months ended October 31, 2019 and 2018 (the "interim statements") are unaudited. In the opinion of management, all adjustments (which include normal recurring adjustments) necessary to present fairly the financial position and operating results for the interim periods have been made. Certain information and footnote disclosure, normally included in annual financial statements prepared in accordance with accounting principles generally accepted in the United States, have been condensed or omitted. The interim statements should be read in conjunction with the consolidated financial statements for the year ended July 31, 2019 and notes thereto contained in the Company's Annual Report on Form 10-K filed with the Securities and Exchange Commission. The consolidated balance sheet at July 31, 2019 has been derived from the audited financial statements at that date. The results of operations for the three months ended October 31, 2019 are not necessarily indicative of the results that may be expected for the fiscal year ending July 31, 2020.

Effect of New Accounting Pronouncements

Adoption of New Accounting Standards

On August 1, 2019, the Company adopted a new accounting standard issued by the Financial Accounting Standards Board ("FASB") on accounting for leases using the modified retrospective method. This new accounting standard requires a lessee to recognize an asset and liability for most leases on its balance sheet. The Company elected the optional transition method that allowed for a cumulative-effect adjustment to the opening balance of retained earnings recorded on August 1, 2019 and did not restate previously reported results in the comparative periods. The Company also elected the package of practical expedients, which among other things, allowed it to carry forward its historical lease classification.

As a result of adoption of the new standard, the Company recorded operating lease assets and lease liabilities of approximately $24.4 million and $25.1 million, respectively as of August 1, 2019. The operating lease liability was determined based on the present value of the remaining minimum rental payments and the operating lease asset was determined based on the value of the lease liability, adjusted for the deferred rent balances of approximately $0.7 million, which were previously included in accrued expenses. There was no cumulative effect adjustment to the opening balance of accumulated deficit. Accounting for the Company's finance leases remains substantially unchanged. The adoption of the new standard did not materially impact the Company's consolidated results of operations or cash flows. In addition, the adoption of this new accounting standard resulted in increased qualitative and quantitative disclosures regarding the amount, timing, and uncertainty of cash flows arising from leases.

The Company elected the package of three practical expedients. As such, the Company did not reassess whether expired or existing contracts are or contain a lease and did not need to reassess the lease classifications or reassess the initial direct costs associated with expired or existing leases. The Company did not elect the hindsight practical expedient. Further, the land easement practical expedient was not elected as the practical expedient is not applicable to the Company. In addition, the Company has elected to take the practical expedient to not separate lease and non-lease components of all asset classes entered into or modified after the effective date. For further details, see Note 8.

Pronouncements Issued but Not Yet Adopted

In June 2016, FASB issued ASU No. 2016-13 Financial Instruments – Credit Losses (Topic 326). This standard changes the impairment model for most financial instruments, including trade receivables, from an incurred loss method to a new forward-looking approach, based on expected losses. The estimate of expected credit losses will require entities to incorporate considerations of historical information, current information and reasonable and supportable forecasts. Adoption of this standard is required for our annual and interim periods beginning August 1, 2021, the effective date for smaller reporting companies and must be adopted using a modified retrospective transition approach. We are currently assessing the impact of the adoption of this standard on our results of operations, financial position and cash flows.

We reviewed all other recently issued accounting pronouncements and have concluded they are not applicable or not expected to be significant to the accounting for our operations.

Concentration Risk

Other than the Medicare program, one provider whose programs are included in the “Third-party payers” and “Health Maintenance Organizations” (“HMO’s”) categories represents approximately 28% and 41% of Clinical Services net revenue for the three months ended October 31, 2019 and 2018 respectively. As of October 31, 2019, other than the Medicare program, one provider whose programs are included in either “Third-party payers” and/or “Health Maintenance Organizations” (“HMO’s”) categories represents approximately 26% of Clinical Services net receivables.

Income Taxes

The provision (benefit) for income taxes and the effective tax rates for the three months ended October 31, 2019 and 2018 is $0. The primary difference between the Company’s effective tax rates and the statutory rates for the three months ended October 31, 2019 and 2018 is due to the change in net operating losses for which a full valuation allowance is maintained. The Company believes that the valuation allowance is necessary as it is not more likely than not that the deferred tax assets will be realized in the foreseeable future based on positive and negative evidence available at this time. This conclusion was reached because of uncertainties relating to future taxable income, in terms of both its timing and its sufficiency, which would enable the Company to realize its deferred tax assets.

Note 2 – Net income (loss) per share

Basic net income (loss) per share represents net income (loss) divided by the weighted average number of common shares outstanding during the period. As a result of the net loss for the three months ended October 31, 2019 and 2018 diluted weighted average shares outstanding are the same as basic weighted average shares outstanding, and do not include the potential common shares from stock options and unvested restricted stock because to do so would be antidilutive. For the three months ended October 31, 2019 and 2018, approximately 127,000, and 135,000, respectively of potential common shares (“in the money options”) and unvested restricted stock were excluded from the calculation of diluted earnings per share.

For the three months ended October 31, 2019 and 2018, the effect of approximately 1,319,000 and 1,330,000 of outstanding “out of the money” options to purchase common shares were excluded from the calculation of diluted net income per share because their effect would be anti-dilutive.

Note 3 – Revenue Recognition

Clinical Services Revenue

Net revenues in the Company’s clinical services business accounted for 63% and 67% of the Company’s total net revenues for the three months ended October 31, 2019 and 2018, respectively and are primarily comprised of a high volume of relatively low-dollar transactions. The services business, which provides clinical testing services, satisfies its performance obligation and recognizes revenues upon completion of the testing process for a specific patient and reporting to the ordering physician. The Company may also perform clinical testing services for other laboratories and will recognize revenue from those services when reported to the ordering laboratory. The Company estimates the amount of consideration it expects to receive from customer groups using the portfolio approach. These estimates of the expected consideration include the impact of contractual allowances and price concessions on our customer group portfolios consisting of healthcare insurers, government payers, client payers and patients as described below. Contracts with customers in our laboratory services business do not contain a financing component, based on the typically limited period of time between performance of services and collection of consideration. The transaction price includes variable consideration in the form of the contractual allowance and price concessions as well as the collectability of the transaction based on the patient intent and ability to pay. The Company uses the expected value method in estimating the amount of the variability included in the transaction price.

The following are descriptions of our laboratory services business portfolios:

Third party payers and Health Maintenance Organizations (HMO’s)

Reimbursements from third party payers, primarily healthcare insurers, and HMO’s are based on negotiated fee-for-service schedules. Revenues consist of amounts billed net of contractual allowances for differences between amounts billed and the estimated consideration the Company expects to receive from such payers, which considers historical collection and denial experience and the terms of the Company’s contractual arrangements. Adjustments to the allowances, based on actual receipts from the third-party payers, are recorded upon settlement.

Collection of the consideration the Company expects to receive is normally a function of providing complete and correct billing information to these third party payers within the various filing deadlines, and typically occurs within 60 to 90 days of billing. Provided the Company has billed healthcare insurers accurately with complete information prior to the established filing deadline, there has historically been little to no collection risk. If there has been a delay in billing, the Company determines if the amounts in question will likely go past the filing deadline, and if so, will reserve accordingly for the billing.

Third-party payers, including government programs, may decide to deny payment or recoup payments for testing that they contend was improperly billed or not medically necessary, against their coverage determinations, or for which they believe they have otherwise overpaid (including as a result of their own error), and we may be required to refund payments already received. Our revenues may be subject to adjustment as a result of these factors among others, including without limitation, differing interpretations of billing and coding guidance and changes by government agencies and payers in interpretations, requirements, and "conditions of participation" in various programs.

Government Payer - Medicare

Reimbursements from Medicare are based on fee-for-service schedules set by Medicare, which is funded by the government. Revenues consist of amounts billed net of contractual allowances for differences between amounts billed and the estimated consideration the Company expects to receive from Medicare, which considers historical collection and denial experience and other factors. Adjustments to the allowances, based on actual receipts from the government payers, are recorded upon settlement.

Collection of consideration the Company expects to receive is normally a function of providing the complete and correct billing information within the various filing deadlines and typically occurs within 60 days of billing. Provided the Company has billed the government payer accurately with complete information prior to the established filing deadline, there has historically been little to no collection risk. If there has been a delay in billing, the Company determines if the amounts in question will likely go past the filing deadline, and, if so, it will reserve accordingly for the billing.

Patient self-pay

Uninsured patients are billed based on established patient fee schedules or fees negotiated with physicians on behalf of their patients. Coinsurance and deductible responsibilities based on fees negotiated with healthcare insurers are also billed to insured patients and included in this portfolio. Collection of billings from patients is subject to credit risk and ability of the patients to pay. Revenues consist of amounts billed net of discounts provided to uninsured patients in accordance with the Company's policies and implicit price concessions. Implicit price concessions represent differences between amounts billed and the estimated consideration the Company expects to receive from patients, which considers historical collection experience and other factors including current market conditions. Adjustments to the estimated allowances, based on actual receipts from the patients, are recorded upon settlement. Patient billings are generally fully reserved for when the related billing reaches 210 days outstanding. Balances are automatically written off when they are sent to collection agencies. Allowances are further adjusted for estimated recoveries of amounts sent to collection agencies based on historical collection experience, which is regularly monitored. Collection of consideration the Company expects to receive typically occurs within 180 days of billing.

The following table represents clinical services net revenues and percentages by type of customer:

	Three months ended October 31, 2019		Three months ended October 31, 2018	
Revenue category				
Third-party payer	$ 6,392	50%	$ 7,907	55%
Medicare	3,153	25	1,974	14
Patient self-pay	1,519	12	2,751	19
HMO's	1,716	13	1,665	12
Total	$ 12,780	100%	$ 14,297	100%

For the three months ended October 31, 2019 and 2018, all of the Company's clinical services were provided within the United States.

Products Revenue

Products revenues consist of the sale of single-use products used in the identification of genomic information and are recognized at a point in time following the transfer of control of such products to the customer, which generally occurs upon shipment. Payment terms for shipments to end-user and distributor customers may range from 30 to 90 days.

Any claims for credit or return of goods may be made generally within 30 days of receipt. Revenues are reduced to reflect estimated credits and returns, although historically these adjustments have not been material. Taxes collected from customers relating to product sales and remitted to governmental authorities are excluded from revenue. Amounts billed to customers for shipping and handling are included in revenue, while the related shipping and handling costs are reflected in cost of products.

Products revenue by geography is as follows:

	Three Months Ended October 31,	
	2019	2018
United States	$ 4,447	$ 3,879
Europe	1,865	2,035
Rest of the world	1,115	1,049
Total	$ 7,427	$ 6,963

Note 4 - Supplemental disclosure for statement of cash flows

For the three months ended October 31, 2019 and 2018, interest paid by the Company was $69 and $12, respectively.

For the three months ended October 31, 2019, cash paid for amounts included in the measurement of operating lease liabilities included in cash flows from operating activities was approximately $1,520.

Note 5 – Inventories

Inventories consist of the following:

	October 31, 2019	July 31, 2019
Raw materials	$ 905	$ 876
Work in process	2,574	2,566
Finished products	4,089	4,400
	$ 7,568	$ 7,842

Note 6 – Goodwill and intangible assets

At October 31, 2019 and July 31, 2019, the Company has goodwill of $7,452 allocated to the Clinical Services reporting unit.

The Company's change in the carrying amount of intangible assets, all in the Products segment is as follows:

	Gross	Accumulated Amortization	Net
July 31, 2019	$ 27,238	$ (26,206)	$ 1,032
Amortization expense	—	(723)	(723)
Foreign currency translation	51	532	583
October 31, 2019	$ 27,289	$ (26,397)	$ 892

Intangible assets, all finite lived, consist of the following:

	October 31, 2019			July 31, 2019		
	Gross	Accumulated Amortization	Net	Gross	Accumulated Amortization	Net
Patents	$ 11,026	$ (11,000)	$ 26	$ 11,027	$ (10,996)	$ 31
Customer relationships	11,798	(10,932)	866	11,746	(10,745)	1,001
Website and acquired content	1,008	(1,008)	—	1,008	(1,008)	—
Licensed technology and other	483	(483)	—	483	(483)	—
Trademarks	2,974	(2,974)	—	2,974	(2,974)	—
Total	$ 27,289	$ (26,397)	$ 892	$ 27,238	$ (26,206)	$ 1,032

At October 31, 2019, information with respect to intangibles assets acquired is as follows:

	Useful life assigned	Weighted average remaining useful life
Customer relationships	8 -15 years	1 year
Other intangibles	10 years	3 years

At October 31, 2019, the weighted average remaining useful life of intangible assets is approximately one year.

Note 7 - Loan Payable

In connection with the purchase of our new facility, on November 27, 2018, a wholly-owned subsidiary (the ""mortgagor subsidiary") of the Company entered into a Fee Mortgage and Security Agreement (the "mortgage agreement") with Citibank, N.A. (the "mortgagee"). The mortgage agreement provides for a loan of $4.5 million for a term of 10 years, bears a fixed interest rate of 5.09% per annum and requires monthly mortgage payments of principal and interest of $30. Debt issuance costs of $72 are being amortized over the life of the mortgage agreement. The balance of unamortized debt issuance cost was $66 at October 31, 2019. At October 31, 2019, the balance owed by the subsidiary under the mortgage agreement was $4.4 million. The Company's obligations under the mortgage agreement are secured by the new facility and by a $750 cash collateral deposit with the mortgagee as additional security. This restricted cash is included in other assets as of October 31, 2019.

The mortgage agreement includes affirmative and negative covenants and events of default, as defined. Events of default include non-payment of principal and interest on debt outstanding, non-performance of covenants, material changes in business, breach of representations, bankruptcy or insolvency, and changes in control. The mortgage includes certain financial covenants. As of October 31, 2019, required financial covenants have been met.

We assumed from the seller an operating lease for a current tenant at the facility which may be extended to February 29, 2020. Rental income from the assumed lease is included in other income.

Minimum future annual principal payments under the mortgage agreement as of October 31, 2019, are as follows:

October 31,	
2020	$ 103
2021	144
2022	152
2023	160
2024	167
Thereafter	3,653
	$ 4,379
Less: Current portion	(138)
Unamortized mortgage cost	(66)
	$ 4,175

Note 8 - Leases

During the first quarter of fiscal 2020, the Company adopted ASU No. 2016-02 "Leases (Topic 842)", which requires leases with durations greater than twelve months to be recognized on the balance sheet. The Company adopted the standard using the modified retrospective approach with an effective date of August 1, 2019. The Company did not apply the new standard to comparative periods and therefore those amounts are not presented below.

The Company determines if an arrangement is or contains a lease at contract inception. The Company leases buildings, office space, patient service centers, and equipment primarily through operating leases, and equipment through a limited number of finance leases. Generally, a right-of-use asset, representing the right to use the underlying asset during the lease term, and a lease liability, representing the payment obligation arising from the lease, are recognized on the balance sheet at lease commencement based on the present value of the payment obligation. For operating leases, expense is recognized on a straight-line basis over the lease term. For finance leases, interest expense on the lease liability is recognized using the effective interest method and amortization of the right-of-use asset is recognized on a straight-line basis over the shorter of the estimated useful life of the asset or the lease term. Short-term leases with an initial term of 12 months or less are not recorded on the balance sheet; the Company recognizes lease expense for these leases on a straight-line basis over the lease term.

The Company primarily uses its incremental borrowing rate in determining the present value of lease payments as the Company's leases generally do not provide an implicit rate.

The Company has lease agreements with (i) right-of-use asset payments and (ii) non-lease components (i.e. payments related to maintenance fees, utilities, etc.,) which have generally been combined and accounted for as a single lease component.

The Company's leases have remaining terms of less than 1 year to 9 years, some of which include options to extend the leases for up to 5 years. The Company's lease terms may include renewal options that are reasonably certain to be exercised and termination options that are reasonably certain not to be exercised.

Certain of the Company's lease agreements include rental payments adjusted periodically for inflation or a market rate which are included in the lease liabilities.

Leases	Balance Sheet Classification	October 31, 2019
Assets		
Operating	Right-of-use assets	$ 23,201
Finance	Property, plant and equipment, net (a)	587
Total lease assets		$ 23,788
Liabilities		
Current:		
Operating	Current portion of operating lease liabilities	$ 4,598
Finance	Finance leases short term	254
Non-current:		
Operating	Operating lease liabilities, non-current	19,382
Finance	Other liabilities and finance leases long term	352
Total lease liabilities		$ 24,586

(a) Finance lease assets net of accumulated amortization were approximately $0.8 million as of October 31, 2019.

Components of lease cost for the three months ended October 31, 2019 were as follows:

Lease cost	
Operating lease cost	$ 1,475
Finance lease cost:	
Amortization of leased assets	55
Interest on lease liabilities	12
Net lease cost	$ 1,542

The maturity of the Company's lease liabilities as of October 31, 2019 is as follows:

Maturity of lease liabilities	Operating leases	Finance leases	Total
Remainder of fiscal 2020	$ 4,409	$ 280	$ 4,689
2021	4,997	181	5,178
2022	3,786	79	3,865
2023	3,284	83	3,367
2024	3,274	8	3,282
Thereafter	9,490	—	9,490
Total lease payments	29,240	631	29,871
Less: Interest (a)	(5,260)	(25)	(5,285)
Present value of lease liabilities	$ 23,980	$ 606	$ 24,586

(a) Primarily calculated using the Company's incremental borrowing rate.

Lease term and discount rate for the three months ended October 31, 2019 were as follows:

Lease term and discount rate	
Weighted-average remaining lease term (years):	
Operating leases	6.6 years
Finance leases	2.7 years
Weighted-average discount rate:	
Operating leases	4.9%
Finance leases	4.3%

See Note 4 for cash flow information on cash paid for amounts included in the measurement of lease liabilities, for the three months ended October 31, 2019.

Note 9 – Accrued Liabilities

Accrued liabilities consist of the following:

	October 31, 2019	July 31, 2019
Payroll, benefits, and commissions	$ 6,215	$ 5,123
Professional fees	731	774
Legal	523	164
Other	1,910	2,301
	$ 9,379	$ 8,362

Note 10 – Stockholders' Equity

Controlled Equity Offering

The Company has a Controlled Equity Offering SM Sales Agreement (the "Sales Agreement") with Cantor Fitzgerald & Co., as sales agent ("Cantor"). Under the Sales Agreement, the Company may offer and sell, from time to time, through Cantor, shares of the Company's common stock, par value $0.01 per share (the "Common Stock"). The Company pays Cantor a commission of 3.0% of the aggregate gross proceeds received under the Sale Agreement. The Company is not obligated to make any sales of the shares under the Sales Agreement. The offering of shares pursuant to the Sales Agreement will terminate upon the earlier of (a) the sale of all of the shares subject to the Sales Agreement or (b) the termination of the Sales Agreement by Cantor or the Company, as permitted therein. The initial agreement contemplated the sale of shares of the Company's common stock having an aggregate offering price of up to $20.0 million. In December 2014, the Sales Agreement was amended in order for the Company to offer and sell additional shares of Common Stock having an aggregate offering price of $20.0 million.

On September 1, 2017, the Company filed with the SEC a "shelf" registration and sales agreement prospectus covering the offering, issuance and sale of our Common Stock that may be issued and sold under the existing Sales Agreement in an aggregate amount of up to $19.15 million. A total of $150 million of securities may be sold under this shelf registration, which was declared effective September 15, 2017.

During the three months ended October 31, 2019 and 2018, the Company did not sell any shares of Common Stock under the Sales Agreement.

Share-based compensation

In January 2011, the Company's stockholders approved the adoption of the 2011 Incentive Plan (the "2011 Plan") which provides for the issuance of equity awards, including among others, options, restricted stock and restricted stock units for up to 3,000,000 Common Shares. The exercise price of options granted under the 2011 Plan, and consistent with other Plans, is equal to or greater than fair market value of the Common Stock on the date of grant. Unless terminated earlier by the Board of Directors, the 2011 Plan will terminate at the earliest of; (a) such time as no shares of Common Stock remain available for issuance under the 2011 Plan or (b) tenth anniversary of the effective date of the 2011 Plan. On January 5, 2018, the Company's stockholders approved the amendment and restatement of the 2011 Plan to increase the number of shares available for issuance by 2,000,000 bringing the total number of shares available for award under the 2011 Plan to 5,000,000. Awards outstanding upon expiration of the 2011 Plan shall remain in effect until they have been exercised, terminated, or have expired.

The total number of shares available for grant as equity awards from the 2011 Incentive Plan is approximately 1,231,000 shares as of October 31, 2019.

The amounts of share-based compensation expense recognized in the periods presented are as follows:

	Three months ended October 31,	
	2019	2018
Stock options	$ 218	$ 232
Restricted stock	1	3
	$ 219	$ 235

The following table sets forth the amount of expense related to share-based payment arrangements included in specific line items in the accompanying statements of operations:

	Three months ended October 31,	
	2019	2018
Selling, general and administrative	$ 219	$ 235
	$ 219	$ 235

No excess tax benefits were recognized during the three month periods ended October 31, 2019 and 2018.

Stock Option Plans

The following table summarizes stock option activity during the three month period ended October 31, 2019:

	Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value (000s)
Outstanding at July 31, 2019	2,351,040	$ 4.53		
Awarded	1,500	3.32		
Exercised	—	—		$ —
Cancelled or expired	(7,999)	5.54		
Outstanding at end of period	2,344,541	4.52	2.6 years	$ 252
Exercisable at end of period	1,334,565	5.16	1.3 years	$ —

As of October 31, 2019, the total future compensation cost related to non-vested options, not yet recognized in the statements of operations, was $0.8 million and the weighted average period over which the remaining expense of these awards is expected to be recognized is eleven months.

The intrinsic value of in the money stock option awards at the end of the period represents the Company's closing stock price on the last trading day of the period in excess of the exercise price multiplied by the number of options.

Performance Stock Units

To better align the long-term interest of executives with growing U.S. practices, beginning in fiscal 2018, the Company granted long-term incentive awards in the form of time based stock options and performance-based restricted stock units ("Performance Stock Units" or "PSUs"). The PSUs earned will be determined over a three-year performance period. The primary performance metrics will be revenue and Adjusted EBITDA growth. Payouts based on revenue and adjusted EBITDA goals will be modified based on Total Shareholder Return ("TSR") performance relative to Enzo's peer group.

During fiscal year 2019 and 2018, the Company awarded PSUs to its executive officers, this award provides for the grant of shares of our common stock at the end of a three–year period based on the achievement of average revenue growth and adjusted EBITDA growth over that period. As of October 31, 2019, the Company did not accrue any compensation expense for these PSU's as the achievement of the growth goals is currently not probable.

The following table summarizes PSU's granted:

Grant Date	Total Grant	Fair Market Value At Grant Date (000s)
7/31/2018	32,000	$ 141
1/3/2019	80,500	$ 225

Restricted Stock Awards

The fair value of a restricted stock award is determined based on the closing stock price on the award date. As of October 31, 2019, there were 1,627 shares of unvested restricted stock which have a weighted average award price of $5.14 per share. As of October 31, 2019, there was approximately $8 of unrecognized compensation cost related to these unvested shares of restricted stock to be recognized over a weighted average remaining period of approximately fifteen months. There were no awards made during the three months ended October 31, 2019. During the three months ended October 31, 2019, there were no vestings of restricted stock awards.

Note 11 – Segment reporting

The Company has three reportable segments: Products, Clinical Services and Therapeutics. The Company's Products segment develops, manufactures, and markets products to research and pharmaceutical customers. The Clinical Services segment provides diagnostic services to the health care community. The Company's Therapeutics segment conducts research and development activities for therapeutic drug candidates. The Company evaluates segment performance based on segment income (loss) before taxes. Costs excluded from segment income (loss) before taxes and reported as "Other" consist of corporate general and administrative costs which are not allocable to the three reportable segments.

Legal and related expenses incurred to defend the Company's intellectual property, which may result in settlements recognized in another segment and other general corporate matters are considered a component of the Other segment. Legal and related expense specific to other segments' activities have been allocated to those segments.

Legal settlements, net, represent activities for which royalties would have been received in the Company's Products segment. Management of the Company assesses assets on a consolidated basis only and therefore, assets by reportable segment have not been included in the reportable segments below. The accounting policies of the reportable segments are the same as those described in the summary of significant accounting policies.

The following financial information represents the operating results of the reportable segments of the Company:

Three months ended October 31, 2019

	Clinical Services	Products	Therapeutics	Other	Consolidated
Revenues	$ 12,780	$ 7,427	—	—	$ 20,207
Operating costs and expenses:					
Cost of revenues	10,975	3,546	—	—	14,521
Research and development	350	516	$ 188	—	1,054
Selling, general and administrative	6,215	2,757	—	$ 2,167	11,139
Legal and related expenses	50		—	1,646	1,696
Total operating costs and expenses	17,590	6,819	188	3,813	28,410
Operating income (loss)	(4,810)	608	(188)	(3,813)	(8,203)
Other income (expense):					
Interest	(12)	18	—	231	237
Other	3	(12)	—	136	127
Foreign exchange loss	—	191	—	—	191
Income (loss) before income taxes	$ (4,819)	$ 805	$ (188)	$ (3,446)	$ (7,648)
Depreciation and amortization included above	$ 409	$ 251	$ —	$ 65	$ 725
Share-based compensation included in above:					
Selling, general and administrative	34	22	—	163	219
Total	$ 34	$ 22	$ —	$ 163	$ 219
Capital expenditures	$ 147	$ 127	$ —	$ —	$ 274

Three months ended October 31, 2018

	Clinical Services	Products	Therapeutics	Other	Consolidated
Revenues	$ 14,297	$ 6,963	—	—	$ 21,260
Operating costs and expenses:					
Cost of revenues	10,968	3,271	—	—	14,239
Research and development	—	507	$ 221	—	728
Selling, general and administrative	6,060	2,924	—	$ 1,986	10,970
Legal and related expenses	36	7	—	1,258	1,301
Total operating costs and expenses	17,064	6,709	221	3,244	27,238
Operating income (loss)	(2,767)	254	(221)	(3,244)	(5,978)
Other income (expense):					
Interest	(18)	16	—	276	274
Other	40	4	—	3	47
Foreign exchange loss	—	(324)	—	—	(324)
Loss before income taxes	$ (2,745)	$ (50)	$ (221)	$ (2,965)	$ (5,981)
Depreciation and amortization included above	$ 403	$ 342	$ —	$ 21	$ 766
Share-based compensation included in above:					
Selling, general and administrative	38	$ 24	—	$ 173	235
Total	$ 38	$ 24	$ —	$ 173	$ 235
Capital expenditures	$ 354	$ 52	$ —	$ —	$ 406

Note 12 – Contingencies

There are currently three cases that were originally brought by the Company in the United States District Court for the District of Delaware ("the Court"), alleging patent infringement against various companies. In 2017, the Court entered summary judgment against the Company that the asserted claims of the '180 and '405 Patents are invalid for nonenablement in cases involving Abbott, Becton Dickinson, Gen-Probe, Hologic, and Roche. The Company appealed the Court's final judgment of invalidity in those cases to the United States Court of Appeals for the Federal Circuit ("Federal Circuit"), which were subsequently consolidated ("the Consolidated Appeals"). The Federal Circuit heard oral argument in the Consolidated Appeals on January 7, 2019. In the Consolidated Appeals, the Company had asked the Federal Circuit to reverse the Court's grants of final and summary judgment of invalidity of the asserted claims of the '180 and '405 patents and to remand the cases against Abbott, Becton Dickinson, and Roche to the Court. On June 20, 2019 the Federal Circuit affirmed the District Court's grant of summary judgment of non-enablement with respect to the '180 and '405 patents. The Company filed a petition for rehearing and rehearing *en banc* on August 5, 2019. The Federal Circuit requested that the Abbott, Becton Dickinson, and Roche Defendants submit a response to that petition, which they filed on October 11, 2019. The Federal Circuit denied Enzo's petition on October 29, 2019.

In April 2019, the Company entered into an agreement with Hologic and Grifols, resolving litigation resulting from four cases originally brought by the Company in the Court. As a result, Enzo dismissed (1) a stayed patent litigation regarding the '180 and '197 Patent against Hologic in the Court; (2) the Consolidated Appeals against Gen-Probe and Hologic resulting from two cases filed in the Court, and (3) the Company's appeal in the litigation involving the '581 Patent that involved both Hologic and Grifols. As a result of the agreement with Hologic, Hologic withdrew from Enzo's Federal Circuit appeal of the Patent Trial and Appeal Board's adverse rulings in two *inter partes* review proceedings regarding the '197 Patent filed by Hologic and joined by Becton Dickinson ("the '197 PTAB Appeals").

Regarding the '197 PTAB Appeals, on August 16, 2019, the Federal Circuit affirmed the Board's decision finding that each of the challenged claims is unpatentable as anticipated or obvious. The Company filed a petition for rehearing and rehearing *en banc* on October 30, 2019, which the Federal Circuit denied on December 4, 2019.

There can be no assurance that the Company will be successful in these litigations. Even if the Company is not successful, management does not believe that there will be a significant adverse monetary impact on the Company. The Company is party to other claims, legal actions, complaints, and contractual disputes that arise in the ordinary course of business. The Company believes that any liability that may ultimately result from the resolution of these matters will not, individually or in the aggregate, have a material adverse effect on its financial position or results of operations.

As described in Note 3, third-party payers, including government programs, may decide to deny payment or recoup payments for testing that they contend was improperly billed or not medically necessary, against their coverage determinations, or for which they believe they have otherwise overpaid (including as a result of their own error), and we may be required to refund payments already received. During the third fiscal quarter of 2019, a significant third-party payer informed us outside of their typical business practice that they believe it overpaid the Company during certain periods of fiscal 2018. The Company disputes these claims, has formally sent legal appeal letters to the payer, and at the present time may exercise its rights under the terms of the agreement with the payer and file a notice of arbitration. At this time, the Company is unable to determine the probability of the outcome of these appeals or reasonably estimate a range of potential losses associated with this claim. As of October 31, 2019, we recorded $0.8 million in legal and related expenses to recognize $0.4 million in reduced reimbursements this payer made to us during the period and $0.4 million in reduced reimbursements made subsequently.

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

The following discussion of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and related notes and other information included elsewhere in this Quarterly Report on Form 10-Q.

Forward-Looking Statements

Our disclosure and analysis in this report, including but not limited to the information discussed in this Item 2, contain forward-looking information about our Company's financial results and estimates, business prospects and products in research and development that involve substantial risks and uncertainties. From time to time, we also may provide oral or written forward-looking statements in other materials we release to the public. Forward-looking statements give our current expectations or forecasts of future events. You can identify these statements by the fact that they do not relate strictly to historic or current facts. They use words such as "anticipate", "estimate", "expect", "project", "intend", "plan", "believe", "will", and other words and terms of similar meaning in connection with any discussion of future operations or financial performance.

In particular, these include statements relating to future actions, prospective products or product approvals, future performance or results of current and anticipated products, sales efforts, expenses, interest rates, foreign currency rates, intellectual property matters, the outcome of contingencies, such as legal proceedings, and financial results. We cannot guarantee that any forward-looking statement will be realized, although we believe we have been prudent in our plans and assumptions. Achievement of future results is subject to risks, uncertainties and inaccurate assumptions. Should known or unknown risks or uncertainties materialize, or should underlying assumptions prove inaccurate, actual results could vary materially from past results and those anticipated, estimated or projected. As a result, investors are cautioned not to place undue reliance on any of our forward-looking statements. Investors should bear this in mind as they consider forward-looking statements. We do not assume any obligation to update or revise any forward-looking statement that we make, even if new information becomes available or other events occur in the future. We are also affected by other factors that may be identified from time to time in our filings with the Securities and Exchange Commission, some of which are set forth in Item 1A - Risk Factors in our Form 10-K filing for the July 31, 2019 fiscal year and updated in Item 1A. “Risk Factors in this Form 10-Q, You are advised to consult any further disclosures we make on related subjects in our Forms 10-Q, 8-K and 10-K reports to the Securities and Exchange Commission. Although we have attempted to provide a list of important factors which may affect our business, investors are cautioned that other factors may prove to be important in the future and could affect our operating results.

You should understand that it is not possible to predict or identify all such factors or to assess the impact of each factor or combination of factors on our business. Consequently, you should not consider any such list to be a complete set of all potential risks or uncertainties.

Overview

Enzo Biochem, Inc. (the “Company” “we”, “our” or “Enzo”) is an integrated diagnostics, clinical lab, and life sciences company focused on delivering and applying advanced technology capabilities to produce affordable reliable products and services that enable our customers to meet their clinical needs. Through a connection with the market, we provide advanced biotechnology solutions to the global community as affordable and flexible quality products and services. We develop, manufacture and sell our proprietary technology solutions and platforms to clinical laboratories, specialty clinics, researchers and physicians globally. Enzo’s structure and business strategy represent the culmination of years of extensive planning and work. The Company has the unique ability to offer low cost, high performance products and services for diagnostic testings, which ideally positions us to capitalize on the reimbursement pressures facing diagnostic labs. Our pioneering work in genomic analysis coupled with our extensive patent estate and enabling platforms have positioned the Company to continue to play an important role in the rapidly growing molecular medicine marketplaces.

Enzo develops low cost diagnostic platform products and related services. Our platform development includes automation-compatible reagent systems and associated products for sample collection and processing through analysis. We develop affordable products and services to improve healthcare, one of the greatest challenges today. Enzo combines over 40 years of expertise in technology development with assay development capabilities and diagnostic testing services to create high performance, cost-effective, and open assay solutions. The ability to combine these assets in one company is unique. With our strong intellectual property portfolio integrated with assay development know-how, production, distribution, validation and services capabilities, we have enabled sustainable products and services for a market that is facing increasing pressure in costs and reimbursement

Enzo technology solutions and platforms and unique operational structure are designed to reduce overall healthcare costs for both government and private insurers. Our proprietary technology platforms reduces our customers’ need for multiple, specialized instruments, and offer a variety of high throughput capabilities together with a demonstrated high level of accuracy and reproducibility. Our genetic test panels are focused on large and growing markets primarily in the areas of personalized medicine, women’s health, infectious diseases and genetic disorders.

For example, our AMPIPROBE® technology platform can lead to the development of an entire line of nucleic acid clinical products that can allow laboratories to offer a complete menu of services for this $7 billion plus growing market at a cost that allows them to enjoy an acceptable margin. Our technology solutions provide tools to physicians, clinicians and other healthcare providers to improve detection, treatment and monitoring of a broad spectrum of diseases and conditions. In addition, reduced patient to physician office visits translates into lower healthcare processing costs and greater patient services.

In the course of our research and development activities, we have built a substantial portfolio of intellectual property assets, comprised of 406 issued patents worldwide and over 75 pending patent applications, along with extensive enabling technologies and platforms.

Below are brief descriptions of each of our operating segments (See Note 11 in the Notes to Consolidated Financial Statements):

Enzo Clinical Lab is a clinical reference laboratory providing a wide range of clinical services to physicians, medical centers, other clinical labs and pharmaceutical companies. The Company believes having a Clinical Laboratory Improvement Amendments of 1988 ("CLIA") certified and College of American Pathologists ("CAP") accredited medical laboratory located in New York provides us the opportunity to more rapidly introduce cutting edge products and services to the clinical marketplace. Enzo Clinical Labs offers an extensive menu of molecular and other clinical laboratory tests and procedures used in patient care by physicians to establish or support a diagnosis, monitor treatment or medication, and search for an otherwise undiagnosed condition. Our laboratory is equipped with state-of-the-art communication and connectivity solutions enabling the rapid transmission, analysis and interpretation of generated data. We operate a full service clinical laboratory in Farmingdale, New York, a network of over 30 patient service centers throughout New York, New Jersey and Connecticut, two free standing "STAT" or rapid response laboratories in New York City and Connecticut, an in-house logistics department, and an information technology department. Under our license in New York State, we are able to offer testing services to clinical laboratories and physicians nationwide.

The Clinical Laboratory Services reporting unit is impacted by various risk factors, including among others, reduced reimbursements from third party payers for testing performed and from recent health care legislation. Despite the growth we have experienced in previous years, there can be no assurance future growth can be achieved. The introduction of new molecular and esoteric tests is expected to increase our revenue per test and could offset impacts from the above factors. The Company anticipates improved profitability with increased service volume.

Enzo Life Sciences manufactures, develops and markets products and tools for clinical research, drug development and bioscience research customers worldwide. Underpinned by broad technological capabilities, Enzo Life Sciences has developed proprietary products used in the identification of genomic information by laboratories around the world. Information regarding our technologies can be found in the "Core Technologies" section. We are internationally recognized and acknowledged as a leader in the development, manufacturing validation and commercialization of numerous products serving not only the clinical research market, but also the life sciences markets in the fields of cellular analysis and drug discovery, among others. Our operations are supported by global operations allowing for the efficient marketing and delivery of our products around the world.

Enzo Therapeutics is a biopharmaceutical venture that has developed multiple novel approaches in the areas of gastrointestinal, infectious, ophthalmic and metabolic diseases, many of which are derived from the pioneering work of Enzo Life Sciences. Enzo Therapeutics has focused its efforts on developing treatment regimens for diseases and conditions for which current treatment options are ineffective, costly, and/or cause unwanted side effects. This focus has generated a clinical and preclinical pipeline, as well as more than 100 patents and patent applications.

Results of Operations
Three months ended October 31, 2019 compared to October 31, 2018
(in 000s)

Comparative Financial Data for the Three Months Ended October 31,

	2019	2018	Increase (Decrease)	% Change
Revenues	20,207	$ 21,260	$ (1,053)	(5)
Operating costs and expenses:				
Cost of revenues	14,521	14,239	282	2
Research and development	1,054	728	326	45
Selling, general and administrative	11,139	10,970	169	2
Legal and related expenses	1,696	1,301	395	30
Total operating costs and expenses	28,410	27,238	1,172	**
Operating loss	(8,203)	(5,978)	(2,225)	**
Other income (expense):				
Interest	237	274	(37)	(14)
Other	127	47	80	**
Foreign currency gain (loss)	191	(324)	515	**
Loss before income taxes	$ (7,648)	$ (5,981)	$ 1,667	**

**** not meaningful**

Consolidated Results:

The “2020 period” and the “2019 period” refer to the three months ended October 31, 2019 and 2018, respectively.

Clinical services revenues for the 2020 period were $12.8 million compared to $14.3 million in the 2019 period, a decrease of $1.5 million or 11%. The decrease is due to lower reimbursement rates, of which $1.4 million is attributable to reduced genetics testing reimbursements due to an increase in denial rates and changes to medical and procedural requirements. Volume declines in genetic testing were nearly offset by increased volume in our other testing services, resulting in a net volume decline of $0.1 million. Total diagnostic testing volume measured by the number of accessions increased nearly 4%, however, the impact from the Protecting Access to Medicare Act (“PAMA”) continues to impact reimbursements from Medicare and third party payers. In the normal course of business, estimated collection amounts are subject to the complexities and ambiguities of third party payer billing, reimbursement regulations and claims processing, as well as issues unique to Medicare and Medicaid programs, and require us to consider the potential for adjustments when estimating variable consideration in the recognition of revenue in the period that the related services are rendered.

Product revenues for the 2020 and 2019 periods were $7.4 million and $6.9 million, respectively. The increase of $0.5 million or 7% is due to higher product order volume in the U.S. market, which was partially offset by lower product order volume in the international market and the negative impact of foreign exchange translation.

The cost of Clinical Services during the 2020 and 2019 periods was $11.0 million. During the 2020 period, increases in reagent costs due to higher testing volumes was offset by cost reductions in other spend. The gross profit margin on Clinical Services was 14% in the 2020 period and 23% in the 2019 period, due to increased volume of lower margin testing, and reduced genetics reimbursements in the 2020 period.

The cost of product revenues was $3.5 million in the 2020 period and $3.3 million in the 2019 period, an increase of $0.2 million or 8% primarily due to the increase in revenues. The gross profit margin on products was 52.2% in the 2020 period and 53.0% in the 2019 period, due to the mix of products sold.

Research and development expenses were $1.0 million in the 2020 period and $0.7 million in the 2019 period, an increase of $0.3 million or 45%. The increase is entirely attributed to the Clinical Services division for lab developed tests.

Selling, general and administrative expenses were approximately $11.1 million during the 2020 period versus $10.9 million during the 2019 period, an increase of $0.2 million or 2%. The Clinical Services expense increased $0.2 million, primarily due to compensation allocations to reflect administrative activities during the 2020 period. The Other segment expense increased $0.2 million due to higher self-insured health care costs. The Life Sciences Products expense decreased $0.2 million primarily due to reductions in business development salaries and related costs.

Legal and related expenses were $1.7 million during the 2020 period compared to $1.3 million in the 2019 period, an increase of $0.4 million. As described in Note 3, third-party payers, including government programs, may decide to deny payment or recoup payments for testing that they contend was improperly billed or not medically necessary, against their coverage determinations, or for which they believe they have otherwise overpaid (including as a result of their own error), and we may be required to refund payments already received. During the third fiscal quarter of 2019, a significant third-party payer informed us outside of their typical business practice that they believe it overpaid the Company during certain periods of fiscal 2018. The Company disputes these claims and has formally sent legal appeal letters to the payer. In the 2020 period, we recorded $0.8 million in legal and related expenses as a result of reduced reimbursements this payer made to us. At this time, the Company is unable to determine the probability of the outcome of these appeals or reasonably estimate a range of potential losses associated with this claim. Also during the 2020 period, we recorded $0.6 million for contested proxy costs relating to our annual shareholders meeting which takes place in January 2020. Legal expense associated with legal activity and related costs associated with on-going litigation and contract dispute where the Company is the plaintiff decreased $1.0 million due to the timing of activities.

Interest income, net was $0.2 million in both the 2020 and 2019 periods and represents interest on cash and cash equivalents. Interest rates were higher in the 2020 period.

The foreign currency gain recognized by the Life Sciences Products segment during the 2019 period was $0.2 million compared to a loss of $0.3 million in the 2019 period, a favorable variance of $0.5 million. During the 2020 period, there was a revaluation gain due to the significant appreciation of the British pound versus the U.S. dollar compared to the 2019 period.

Liquidity and Capital Resources

At October 31, 2019, the Company had cash and cash equivalents and restricted cash of $57.6 million of which $0.6 million was in foreign accounts, as compared to cash and cash equivalents and restricted cash of $60.9 million, of which $0.7 million was in foreign accounts at July 31, 2019. It is the Company's current intent to permanently reinvest these funds outside of the United States, and its current plans do not demonstrate a need to repatriate them to fund its United States operations. The Company had working capital of $54.3 million at October 31, 2019 compared to $65.4 million at July 31, 2019. The decrease in working capital of $11.1 million was due to the adoption of the new accounting standard for leases, which resulted in the recognition of $4.6 million of current operating lease liabilities at October 31, 2019, the period loss, and the net changes in other current operating assets and liabilities.

Net cash used in operating activities during the 2020 period was approximately $2.1 million as compared to $6.2 million during the 2019 period, a decrease of approximately $4.1 million. The decrease is mainly due to an increase in net loss of $1.7 offset by an increase in net changes in assets and liabilities of $6.4 million.

Net cash used in investing activities in fiscal 2020 and 2019 was approximately $0.3 million and $1.0 million, respectively. The 2020 period consists of capital expenditures.

Net cash used in financing activities in fiscal 2020 $0.2 million as compared to $0.1 million in fiscal 2019.

The mortgage agreement, which provides for a loan of $4.5 million for a term of 10 years, bears a fixed interest rate of 5.09% per annum and requires monthly mortgage payments of $30. At October 31, 2019, the balance owed under the mortgage agreement was $4.4 million. The Company's obligations under the mortgage agreement are secured by the purchased facility and by a $750 cash collateral deposit with the mortgagee as additional security. This restricted cash is included in other assets as of October 31, 2019. See Note 7 – Loan Payable.

The Company believes that its current cash and cash equivalents level and utilization of the Controlled Equity Offering program if necessary, are sufficient for its foreseeable liquidity and capital resource needs over at least the next twelve (12) months, although there can be no assurance that future events will not alter such view. We expect our cash reserves will be reduced over the next four quarters as we implement our strategy of developing innovative diagnostic platforms and assays for use by independent labs. Although there can be no assurances, in the event additional capital is required, the Company believes it has the ability to raise additional funds through equity offerings or other sources. Our liquidity plans are subject to a number of risks and uncertainties, including those described in the Item 1A. "Risk Factors" section of our Form 10-K for the year ended July 31, 2019, some of which are outside our control. Macroeconomic conditions could limit our ability to successfully execute our business plans and therefore adversely affect our liquidity plans.

Contractual Obligations

There have been no material changes to our Contractual Obligations as reported in our Form 10-K for the fiscal year ended July 31, 2019. Management is not aware of any material claims, disputes or settled matters concerning third party reimbursement that would have a material effect on our financial statements, except as disclosed in Note 12 to the Consolidated Financial Statements.

Off-Balance Sheet Arrangements

The Company does not have any “off-balance sheet arrangements” as such term is defined in Item 303(a)(4) of Regulation S-K.

Critical Accounting Policies

The Company’s discussion and analysis of its financial condition and results of operations are based upon Enzo Biochem, Inc.’s consolidated financial statements, certain information and footnote disclosure, normally included in annual financial statements prepared in accordance with accounting principles generally accepted in the United States, have been condensed or omitted, as permitted under rules promulgated by the Security and Exchange Commission. The preparation of these financial statements requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses. These estimates and judgments also affect related disclosure of contingent assets and liabilities.

On an on-going basis, we evaluate our estimates, including those related to contractual expense, allowance for uncollectible accounts, inventory, right-of-use assets, intangible assets and income taxes. The Company bases its estimates on experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Revenues – Clinical Services

Contractual Adjustment

The Company’s estimate of contractual adjustment is based on significant assumptions and judgments, such as its interpretation of payer reimbursement policies, and bears the risk of change. The estimation process is based on the experience of amounts approved as reimbursable and ultimately settled by payers, versus the corresponding gross amount billed to the respective payers. The contractual adjustment is an estimate that reduces gross revenue, based on gross billing rates, to amounts expected to be approved and reimbursed. Gross billings are based on a standard fee schedule we set for all third party payers, including Medicare, HMO’s and managed care. The Company adjusts the contractual adjustment estimate quarterly, based on its evaluation of current and historical settlement experience with payers, industry reimbursement trends, and other relevant factors. The other relevant factors that affect our contractual adjustment include the monthly and quarterly review of: 1) current gross billings and receivables and reimbursement by payer, 2) current changes in third party arrangements and 3) the growth of in-network provider arrangements and managed care plans specific to our Company.

Our clinical business is primarily dependent upon reimbursement from third-party payers, such as Medicare (which principally serves patients 65 and older) and insurers. We are subject to variances in reimbursement rates among different third-party payers, as well as constant changes of reimbursement rates. Changes that decrease reimbursement rates or coverage would negatively impact our revenues. The number of individuals covered under managed care contracts or other similar arrangements has grown over the past several years and may continue to grow in the future. In addition, Medicare and other government healthcare programs continue to shift to managed care. These trends will continue to reduce our revenues from these programs.

During the three months ended October 31, 2019 and 2018, the contractual adjustment percentages, determined using current and historical reimbursement statistics, were 88.3% and 87.5%, respectively, of gross billings. In general, the Company believes a decline in reimbursement rates or a shift to managed care or similar arrangements may be offset by the positive impact of an increase in the number of molecular tests we perform. However, there can be no assurance that we can increase the number of tests we perform or that if we do increase the number of tests we perform, that we can maintain that higher number of tests performed, or that an increase in the number of tests we perform would result in increased revenue.

The Company estimates (by using a sensitivity analysis) that each 1% point change in the contractual adjustment percentage could result in a change in clinical services revenues of approximately $1.1 million for the three months ended October 31, 2019 and 2018, and a change in the net accounts receivable of approximately $0.4 million as of October 31, 2019.

Our clinical services financial billing system records gross billings using a standard fee schedule for all payers and does not record contractual adjustment by payer at the time of billing. Therefore, we are unable to quantify the effect contractual adjustments recorded during the current period have on revenue recorded in a previous period. However, we can reasonably estimate our monthly contractual adjustment to revenue on a timely basis based on our quarterly review process, which includes:

- an analysis of industry reimbursement trends;
- an evaluation of third-party reimbursement rates changes and changes in reimbursement arrangements with third-party payers;
- a rolling monthly analysis of current and historical claim settlement and reimbursement experience statistics with payers; and
- an analysis of current gross billings and receivables by payer.

Accounts Receivable

Accounts receivable are reported at realizable value, net of allowances for doubtful accounts, which is estimated and recorded in the period of the related revenue.

The following is a table of the Company's net accounts receivable by services and by products. Net receivables for Clinical Services are detailed by billing category and as a percent to its total net receivables. At October 31, 2019, and July 31, 2019, approximately 64% and 63%, respectively, of the Company's net accounts receivable relates to its Clinical Laboratory Services business, which operates in the New York, New Jersey and Connecticut medical communities.

The accounts receivable balance for Life Science products includes $0.9 million or 26% and $1.2 million or 32% of foreign receivables as of October 31, 2019 and July 31, 2019, respectively.

Net accounts receivable

Billing category	As of October 31, 2019		As of July 31, 2019	
Clinical Services				
Third party payers	$ 2,568	41%	$ 2,956	44%
Patient self-pay	1,916	30	2,360	35
Medicare	1,122	18	910	13
HMO's	670	11	574	8
Total Clinical Services	6,276	100%	6,800	100%
Total Products	3,601		3,938	
Total accounts receivable	$ 9,877		$ 10,738	

The Company's ability to collect outstanding receivables from third party payers is critical to its operating performance and cash flows. The primary collection risk lies with uninsured patients or patients for whom primary insurance has paid but a patient portion remains outstanding. The Company also assesses the current state of its billing functions in order to identify any known collection or reimbursement issues in order to assess the impact, if any, on the allowance estimates, which involves judgment.

The Company believes that the collectability of its receivables is directly linked to the quality of its billing processes, most notably, those related to obtaining the accurate patient information in order to bill effectively for the services provided. Should circumstances change (e.g. shift in payer mix, decline in economic conditions or deterioration in aging of receivables), our estimates of net realizable value of receivables could be reduced by a material amount. As of October 31, 2019, approximately 26% of Clinical Labs receivables are from one payer.

Billing for clinical services is complicated because of many factors, especially: the differences between our standard gross fee schedule for all payers and the reimbursement rates of the various payers we deal with, disparity of coverage and information requirements among the various payers, and disputes with payers as to which party is responsible for reimbursement.

The following table indicates the Clinical Services aged gross receivables by payer group which is prior to adjustment to gross receivables for: 1) contractual adjustment, 2) fully reserved balances not yet written off, and 3) other revenue adjustments.

As of October 31, 2019	Total	%	Third Party Payers	%	Medicare	%	Self-Pay	%	HMO's	%
1-30 days	$ 20,736	47	$ 13,358	50	$ 3,862	44	$ 1,129	20	$ 2,387	91
31-60 days	6,289	14	4,158	16	984	11	1,010	18	137	5
61-90 days	4,328	10	2,884	11	655	7	754	13	34	1
91-120 days	3,050	7	1,893	7	430	5	701	12	27	1
121-150 days	2,235	5	1,225	5	379	4	615	11	16	1
Greater than 150 days	7,203	16	3,220	12	2,477	28	1,478	26	28	1
Totals	$ 43,841	100%	$ 26,738	100%	$ 8,787	100%	$ 5,687	100%	$ 2,629	100%

As of July 31, 2019	Total	%	Third Party Payers	%	Medicare	%	Self-Pay	%	HMO's	%
1-30 days	$ 22,031	50	$ 14,232	53	$ 4,114	52	$ 1,236	20	$ 2,449	90
31-60 days	6,659	15	4,473	17	952	12	1,109	18	125	5
61-90 days	4,185	10	2,742	10	495	6	903	15	45	2
91-120 days	2,786	6	1,708	6	316	4	736	12	26	1
121-150 days	2,014	5	1,137	4	256	3	610	10	11	—
Greater than 150 days	6,007	14	2,684	10	1,709	22	1,563	25	51	2
Totals	$ 43,682	100%	$ 26,976	100%	$ 7,842	100%	$ 6,157	100%	$ 2,707	100%

Income Taxes

The Company accounts for income taxes under the liability method of accounting for income taxes. Under the liability method, deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. The liability method requires that any tax benefits recognized for net operating loss carry forwards and other items be reduced by a valuation allowance where it is not more likely than not the benefits will be realized in the foreseeable future. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. Under the liability method, the effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

It is the Company's policy to provide for uncertain tax positions and the related interest and penalties based upon management's assessment of whether a tax benefit is more likely than not to be sustained upon examination by tax authorities. To the extent the Company prevails in matters for which a liability for an unrecognized tax benefit is established or is required to pay amounts in excess of the liability, the Company's effective tax rate in a given financial statement period may be affected.

Inventory

The Company values inventory at the lower of cost (first-in, first-out) or net realizable value, which approximates market. Work-in-process and finished goods inventories consist of material, labor, and manufacturing overhead. Write downs of inventories to net realizable value are based on a review of inventory quantities on hand and estimated sales forecasts based on sales history and anticipated future demand. Unanticipated changes in demand could have a significant impact on the value of our inventory and require additional write downs of inventory which would impact our results of operations.

Goodwill and Intangible Assets

Goodwill represents the excess of the cost of an acquisition over the fair value of the net assets acquired. Intangible assets (exclusive of patents), arose primarily from acquisitions, and primarily consist of customer relationships, trademarks, licenses, and website and database content. Finite-lived intangible assets are amortized according to their estimated useful lives, which range from 4 to 15 years. Patents represent capitalized legal costs incurred in pursuing patent applications. When such applications result in an issued patent, the related capitalized costs, if any, are amortized over a ten year period or the life of the patent, whichever is shorter, using the straight-line method. The Company reviews its issued patents and pending patent applications, and if it determines to abandon a patent application or that an issued patent no longer has economic value, the unamortized balance in deferred patent costs relating to that patent is immediately expensed.

The Company tests goodwill and long-lived assets annually as of the first day of the fourth quarter, or more frequently if indicators of potential impairment exist. In assessing goodwill and long-lived assets for impairment, the Company has the option to perform a qualitative assessment to determine whether the existence of events or circumstances leads to a determination that it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If the Company determines that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, the Company is not required to perform a quantitative test in assessing goodwill and long-lived assets for impairment. However, if the Company concludes otherwise or elects not to perform the qualitative assessment, then it identifies the reporting units and compares the fair value of each of these reporting units to their respective carrying amount. If the carrying amount of the reporting unit is less than its fair value, no impairment exists. If the carrying amount of the reporting unit is higher than its fair value, the impairment charge is the amount by which the carrying amount exceeds its fair value, not to exceed the total amount of goodwill and intangibles allocated to the reporting unit.

Restricted Cash

As of October 31, 2019 the Company had a mortgage collateralized by a money market account of $750 to the benefit of the mortgagee of the building purchased in November 2018. This restricted cash was classified as other assets as of October 31, 2019 and July 31, 2019.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risk from changes in foreign currency exchange rates resulting from acquisitions with foreign locations (See Item 1A. Risk Factors section of the Form 10-K for the fiscal year ended July 31, 2019) that could impact our results of operations and financial position. We do not currently engage in any hedging or market risk management tools.

Foreign Currency Exchange Rate Risk

The financial reporting of our non-U.S. subsidiaries is denominated in currencies other than the U.S. dollar. Since the functional currency of our non-U.S. subsidiaries is the local currency, foreign currency translation adjustments are accumulated as a component of accumulated other comprehensive income in stockholders' equity. Assuming a hypothetical increase of 10% in the value of the U.S. dollar versus foreign currencies at October 31, 2019, our assets and liabilities would decrease by $0.4 million and $0.1 million, respectively, and our net sales and net earnings (loss) would decrease by $0.8 million and $0.1 million, respectively, on an annual basis.

We also maintain intercompany balances and loans with subsidiaries in different local currencies. These amounts are at risk of foreign exchange losses if exchange rates fluctuate. Assuming a hypothetical increase of 10% in the value of the U.S. dollar versus foreign currencies, our pre-tax earnings (loss) would be unfavorably impacted by approximately $1.6 million on an annual basis.

Interest Rate Risk

As of October 31, 2019, we have fixed interest rate financing on a building mortgage and on transportation and equipment finance leases.

Item 4. Controls and Procedures

(a) Evaluation of Disclosure Controls and Procedures

As of the end of the period covered by this report, the Company's management conducted an evaluation (as required under Rules 13a-15(b) and 15d-15(b) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) of the Company's "disclosure controls and procedures" (as such term is defined under the Exchange Act), under the supervision and with the participation of the principal executive officer and the principal financial officer. Based on this evaluation, the principal executive officer and the principal financial officer concluded that the Company's disclosure controls and procedures are effective as of the end of the period covered by this report. Notwithstanding the foregoing, a control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that it will detect or uncover failures within the Company to disclose material information otherwise required to be set forth in the Company's periodic reports.

(b) Changes in Internal Controls over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended October 31, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II – OTHER INFORMATION

Item 1. Legal Proceedings

There have been no other material developments with respect to previously reported legal proceedings discussed in the annual report on Form 10-K for the fiscal year ended July 31, 2019 filed with the Securities and Exchange Commission, other than as noted in Note 12 to the Consolidated Financial Statements as of October 31, 2019.

Item 1A. Risk Factors

There has been no material changes from the risk factors disclosed in Part 1, Item 1A of the Company's Annual Report on Form 10-K for the fiscal year ended July 31, 2019.

Item 6. Exhibits

Exhibit No.	Exhibit
31.1	Certification of Elazar Rabbani, Ph.D. pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Barry Weiner pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification of Elazar Rabbani, Ph.D. pursuant to 18 U.S.C. §1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification of Barry Weiner pursuant to 18 U.S.C. §1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101. INS*	XBRL Instance Document
101. SCH*	XBRL Taxonomy Extension Schema Document
101. CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definitions Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

*XBRL (Extensible Business Reporting Language) information is being furnished and not filed for purposes of Sections 11 and 12 of the Securities Act of 1933 and Section 18 of 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 the undersigned thereunto duly authorized.

ENZO BIOCHEM, INC.
(Registrant)

Date: December 10, 2019

by: /s/ Barry Weiner
President, Chief Financial Officer, Principal Accounting Officer, Treasurer and Director

EXHIBIT 31.1

CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Elazar Rabbani, Ph.D., certify that:

1. I have reviewed this quarterly report on Form 10-Q of Enzo Biochem, Inc. (the "registrant").

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 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 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 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: December 10, 2019

By: /s/ Elazar Rabbani, Ph.D.
Elazar Rabbani, Ph.D.
Chairman of the Board, Chief Executive Officer and Secretary

EXHIBIT 31.2

CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Barry Weiner, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Enzo Biochem, Inc. (the "registrant").

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 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 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 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: December 10, 2019

By: /s/ Barry Weiner
Barry Weiner
President, Chief Financial Officer, Principal Accounting Officer, Treasurer and Director

EXHIBIT 32.1

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

In connection with the Quarterly Report of Enzo Biochem, Inc., and Subsidiaries ("the Company") on Form 10-Q for the period ended October 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Elazar Rabbani, Ph.D., Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: December 10, 2019

By: /s/ Elazar Rabbani, Ph.D.
Elazar Rabbani, Ph.D.
Chairman of the Board, Chief Executive Officer and Director

EXHIBIT 32.2

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

In connection with the Quarterly Report of Enzo Biochem, Inc., and Subsidiaries ("the Company") on Form 10-Q for the period ended October 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Barry Weiner, President and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: December 10, 2019

By: /s/ Barry Weiner
Barry Weiner
President, Chief Financial Officer, Principal Accounting Officer, Treasurer and Director