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

FORM 11-K

FOR ANNUAL REPORTS OF EMPLOYEE STOCK PURCHASE, SAVINGS AND SIMILAR PLANS PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

(MARK ONE)

☑ ANNUAL REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE FISCAL YEAR ENDED DECEMBER 31, 2019

OR

□ TRANSITION REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE TRANSITION PERIOD FROM _____ TO _____

COMMISSION FILE NUMBER 001-09974

Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan (Full title of the plan and the address of the plan, if different from that of the issuer named below:)

Enzo Biochem, Inc. 527 Madison Ave. New York, NY 10022 (Name of issuer of the securities held pursuant to the plan and the address of its principal executive office)

ENZO BIOCHEM, INC. SALARY REDUCTION PROFIT SHARING PLAN

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Plan Administrator, Participants and Beneficiaries of the Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan

Opinion on the Financial Statements

We have audited the accompanying statements of net assets available for benefits of the Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan (the "Plan") as of December 31, 2019 and 2018, and the related statement of changes in net assets available for benefits for the year ended December 31, 2019, and the related notes (collectively the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the net assets available for benefits of the Plan as of December 31, 2019 and 2018, and the changes in net assets available for benefits for the year ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on the Plan's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Plan in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Plan is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Report on Supplemental Information

The supplemental information in the accompanying schedule of assets (held at end of year) as of December 31, 2019 has been subjected to audit procedures performed in conjunction with the audit of the Plan's financial statements. The supplemental information is the responsibility of the Plan's management. Our audit procedures included determining whether the supplemental information reconciles to the financial statements or the underlying accounting and other records, as applicable, and performing procedures to test the completeness and accuracy of the information presented in the supplemental information. In forming our opinion on the supplemental information, we evaluated whether the supplemental information, including its form and content, is presented in conformity with the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974. In our opinion, the supplemental information is fairly stated, in all material respects, in relation to the financial statements as a whole.

/s/ EisnerAmper LLP

We have served as the Plan's auditor since 2010.

EISNERAMPER LLP New York, NY August 12, 2020



ENZO BIOCHEM, INC. SALARY REDUCTION PROFIT SHARING PLAN

Statements of Net Assets Available for Benefits

December 31,

	2019	 2018
ASSETS		
Investments, at fair value:		
Mutual funds \$	32,523,374	\$ 26,750,617
Enzo Biochem, Inc. common stock	2,961,454	2,516,906
	35,484,828	29,267,523
Receivables:		
Employer's contributions	836,494	829,689
Participants' contributions	-	66,885
Notes receivable – participants	766,493	660,890
-	1,602,987	1,557,464
TOTAL ASSETS	37,087,815	30,824,987
-		
NET ASSETS AVAILABLE FOR BENEFITS S	37,087,815	\$ 30,824,987
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See notes to financial statements.

ENZO BIOCHEM, INC. SALARY REDUCTION PROFIT SHARING PLAN

Statement of Changes in Net Assets Available for Benefits

For the Year Ended December 31, 2019

Additions (deductions) from net assets attributed to:

Investment income:		
Interest and dividends	\$	1,686,153
Net realized/unrealized appreciation in value of investments		4,286,583
Interest on notes receivable - participants		35,303
Contributions:		
Participants' contributions		2,280,301
Employer's contributions		836,494
Benefits paid to participants		(2,786,294)
Administrative expenses		(75,712)
Net increase in net assets available for benefits		6,262,828
Net assets available for benefits, beginning of year		30,824,987
		<u> </u>
Net assets available for benefits, end of year	\$	37,087,815
	φ	57,007,015

See notes to financial statements.

NOTE 1: PLAN DESCRIPTION

The following description of the Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan (the "Plan") provides only general information. Participants should refer to the Plan Agreement, as amended, for a more complete description of the Plan's provisions.

General

The Plan is a defined contribution plan covering all eligible United States based full-time employees of Enzo Biochem, Inc., (the "Plan Sponsor"), and its wholly owned subsidiaries, Enzo Clinical Labs, Inc., Enzo Therapeutics, Inc., and Enzo Life Sciences, Inc. (collectively, the "Company") who have completed one month of service and have attained age twenty-one. The Plan is subject to the provisions of the Employee Retirement Income Security Act of 1974 ("ERISA").

Contributions

Eligible employee participants can elect to defer up to 70% of compensation to the maximum amount permitted by the Internal Revenue Code (the "Code") for each year (\$19,000 in 2019 and \$18,500 in 2018). Catch-up contributions are also permitted for participants who have attained age 50 by December 31st, in accordance with Section 414(v) of the Code, in an amount up to a maximum of \$6,000 in 2019 and 2018, bringing those participants' statutory maximum limitation to \$25,000 in 2019 and \$24,500 in 2018. In 2019, participant contributions totaled \$2,280,301 which includes \$47,863 in rollover contributions.

The Company may contribute to the Plan annually, a discretionary matching contribution and a non-elective employer contribution. For 2019 and 2018 the discretionary matching contribution was equal to 50% of the participant's 401(k) contribution, not to exceed 5% of the participant's annual compensation, as defined. Participants who have completed 1,000 hours of service during the plan year and are actively employed as of the last day of the plan year shall be deemed eligible to share in the matching contribution or the non-elective employer contribution for the year. In 2019, the total matching contributions were \$836,494 in the form of Enzo Biochem Inc. common stock. There were no non-elective employer contributions made in 2019 or 2018.

The Plan provides that unless the participant affirmatively elects otherwise, the participant's compensation will automatically be reduced by 3%, which will be considered to be the Participant's salary reduction election.

Participant Accounts

Participants direct both their contributions and employer contributions into various investment options offered by the Plan which include a choice of mutual funds and the common stock of Enzo Biochem, Inc. Each participant's account is credited with the participant's contribution and allocations of (a) the Company's matching contribution and non-elective employer contribution, (b) Plan earnings and c) charged with an allocation of administrative expenses. Allocations are based on participant compensation, account balances or specific participant transactions, as defined. The benefit to which a participant is entitled is the benefit that can be provided from the participant's vested account.

The Plan allows a participant to elect to classify all or part of his or her elective deferrals as a Roth 401(k) deferral.

Vesting

Participants' contributed funds arising from salary reductions and the earnings thereon, are fully vested at all times. Vesting in the Company's discretionary matching contribution and non-elective employer contribution and earnings thereon, is ratable over four years of service.

Forfeitures

Forfeited non-vested amounts may be used to reduce the Company's future contributions to the Plan or pay Plan expenses. During the year ended December 31, 2019, forfeitures of \$60,831 were used to pay Plan expenses. Forfeited non-vested accounts available at December 31, 2019 and 2018 were \$33,316 and \$66,473, respectively.



NOTE 1: PLAN DESCRIPTION (continued)

Notes Receivable from Participants

Notes receivable from participants are measured at their unpaid principal balance plus any accrued but unpaid interest. Participants may borrow from their accounts a minimum of \$1,000 up to a maximum of 50% of their vested account balance or \$50,000. Participants are entitled to borrow from their account for a maximum loan term of five years unless the proceeds are used to acquire a principal residence in which case it may exceed five years. The loans, classified as Notes Receivable from Participants, are secured by the participant's vested account balance and bear a reasonable rate of interest, ranging from 4.5% to 5.0% at December 31, 2019. Principal and interest is paid ratably through payroll deductions. Delinquent notes receivable from participants are reclassified as distributions based upon the terms of the Plan document. Related fees are recorded as administrative expenses and are expensed when they are incurred.

Payment of Benefits

On termination of service due to death, disability or retirement, participants may elect to receive an amount equal to the value of the vested interest in their account in a lump sum amount. For termination of service due to other reasons, a participant may receive the value of the vested interest in their account as a lump sum distribution. Benefits are payable in the form of cash or Company common stock.

Plan Expenses

Substantially all expenses incurred in connection with the administration of the Plan are paid by the Plan. Costs associated with participant loans are paid by participants.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting

The Plan's financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America and under the accrual basis method of accounting.

Payment of Benefits

Benefits are recorded when paid.

Use of Estimates

The preparation of the financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect reported amounts of net assets available for benefits at the date of the financial statements and the accompanying footnotes and the changes in net assets available for benefits during the reporting period and when applicable disclosures of contingent assets and liabilities at the date of the financial statements. Actual results could differ from those estimates.

Investment Valuation and Income Recognition

The Plan's investments are stated at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. See Note 3 for discussion of fair value measurements.

Interest income is recorded on the accrual basis. Dividends are recorded on the ex-dividend date. Investment earnings are reinvested in the respective funds. Investment earnings include the Plan's proportionate share of realized gains and losses on the disposal of investments, and appreciation or depreciation in the fair value of the underlying investments. All purchases and sales are recorded on a trade date basis.



NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

The Plan presents in the statement of changes in net asset available for benefits, the net appreciation/depreciation in fair value of its investments, which consists of the realized gains or losses and the unrealized appreciation/depreciation on those investments.

NOTE 3: FAIR VALUE MEASUREMENTS

The Financial Accounting Standards Board's ("FASB"), Accounting Standards Codification ("ASC" 820), *Fair Value Measurements and Disclosures*, provides a framework for measuring fair value. That framework provides a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurement) and the lowest priority to unobservable inputs (level 3 measurement). The three levels of the fair value hierarchy under ASC 820 are described as follows:

Level 1 - Inputs to the valuation methodology are unadjusted quoted prices for identical assets or liabilities in active markets that the Plan has the ability to access.

Level 2 - Inputs to the valuation methodology include: quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in inactive markets; inputs other than quoted prices that are observable for the assets or liability; inputs that are derived principally from or corroborated by observable market data by correlation or other means.

If the asset or liability has a specified (contractual) term, the level 2 Input must be observable for substantially the full term of the asset or liability.

Level 3 - Inputs to the valuation methodology are unobservable and significant to the fair value measurements.

The asset or liability's fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Valuation techniques used need to maximize the use of observable inputs and minimize the use of unobservable inputs.

Following is a description of the valuation methodologies used for assets measured at fair value. There have been no changes in the methodologies used at December 31, 2019 and 2018.

Mutual funds – Valued at the daily closing price as reported by the fund. Mutual funds held by the Plan are open-ended mutual funds that are registered with the Securities and Exchange Commission. These funds are required to publish their daily net asset value ("NAV") and to transact at that price. The mutual funds held by the Plan are deemed to be actively traded.

NOTE 3: FAIR VALUE MEASUREMENTS (continued)

Common stocks - Enzo Biochem, Inc. - Valued at the closing price reported on the active market on which the individual securities are traded.

The methods described may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, although the Plan believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

The following tables sets forth by level, within the fair value hierarchy, the Plan's investments as of December 31:

	Assets at Fai	Assets at Fair Value as of	
	December 31, 2019	December 31, 2018	
	Level 1	Level 1	
Mutual funds	32,523,374	26,750,617	
Common stock-Enzo Biochem, Inc.	2,961,454	2,516,906	
	\$ 35,484,828	\$ 29,267,523	

Changes in Fair Value Levels

The availability of observable market data is monitored to assess the appropriate classification of financial instruments within the fair value hierarchy. Changes in economic conditions or model-based valuation techniques may require the transfer of financial instruments from one fair value level to another.

NOTE 4: RIGHT TO TERMINATE PLAN

Although it has not expressed any intent to do so, the Company has the right under the Plan to discontinue its contributions at any time and to terminate the Plan subject to the provisions of ERISA. In the event of Plan termination participants would become 100% vested in their Company contributions.

NOTE 5: TAX STATUS

The Plan has adopted the Fidelity Management and Research Company Volume Submitter plan. On March 31, 2014 the Internal Revenue Service stated in an advisory letter that the Volume Submitter adopted by the Plan, as then assigned, was in compliance with the applicable requirements of the Internal Revenue Code and therefore, the related trust is exempt from taxation. The Plan has been amended since receiving the letter. However, the Plan administrator believes that the Plan is currently designed and being operated in compliance with the applicable requirements of the Internal Revenue Code. Therefore, the Plan administrator believes that the Plan is qualified and the related trust is tax-exempt.

Accounting principles generally accepted in the United States of America require plan management to evaluate tax positions taken by the Plan and recognize a tax liability if the plan has taken an uncertain position that more likely than not would not be sustained upon examination by a government authority. The plan administrator has analyzed the tax positions taken by the Plan, and has concluded that as of December 31, 2019, there are no uncertain positions taken or expected to be taken that would require recognition of a liability or disclosure in the financial statements. The Plan is subject to routine examination by taxing jurisdictions; however, there are currently no examinations for any tax periods in progress.



NOTE 6: RELATED PARTY AND PARTY IN INTEREST TRANSACTIONS

During 2019, the Plan purchased 325,057 shares of common stock of the Plan sponsor, at market prices totaling \$862,317 and sold 104,390 shares of common stock at market prices totaling approximately \$345,273. At December 31, 2019 and 2018, the Plan held Enzo Biochem, Inc. common stock with a fair value of \$2,961,454 and shares owned of 1,126,028 and a fair value of \$2,516,906 and shares owned of 905,362, respectively.

Fidelity Management Trust Company ("FMTC") is the trustee and recordkeeper of the Plan. Certain Plan investments are shares of mutual funds managed by affiliates of FMTC. Therefore, these transactions qualify as Party-in-interest transactions. Fees paid by the Plan for the investment management services are included in net appreciation in fair value of investments.

Fees paid by the Plan to FMTC amounted to \$15,054 for the year ended December 31, 2019. In addition the Plan paid for legal, advisory and auditing fees amounting to \$60,658 for the year ended December 31, 2019.

NOTE 7: RISKS AND UNCERTAINTIES

The Plan invests in various investment securities. Investment securities are exposed to various risk such as interest rate, market, and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect participants' account balances and the amounts reported in the statements of net assets available for benefits.

Volatility in the financial markets may significantly impact the subsequent valuation of the Plan's investments. Accordingly, the valuation of investments at December 31, 2019 may not necessarily be indicative of amounts that could be realized in a current market exchange.

The extent of the impact of the coronavirus ("COVID-19") outbreak on the financial performance of the Plan's investments will depend on future developments, including the duration and spread of the outbreak and related advisories and restrictions and the impact of COVID-19 on the financial markets and the overall economy, all of which are highly uncertain and cannot be predicted. If the financial markets and/or the overall economy are impacted for an extended period, the Plan's investment results may be materially adversely affected. COVID-19 poses risks to the Company as well, given that such public health epidemics, if sustained, could impact Company employees, customers, supply chain and production in affected regions. Additionally, a prolonged widespread epidemic could adversely impact global economies and financial markets resulting in an economic downturn that may impact demand for the Company's products and services. Such impacts could adversely affect Company profitability, cash flows, financial results, and the ability to make required Plan contributions. At this point, the extent to which the coronavirus may impact the Company's financial results is uncertain. The Company expects its COVID-19 related products and services to partially offset revenue declines. Enzo has publicly announced that it has applied its technical expertise in molecular diagnostics and serological testing to develop mext generation COVID-19 and related antibody testing options. Enzo's innovations include virus-inactivating specimen collection media to lessen transmission risks for healthcare providers and clinical laboratory personnel, the development of more relevant positive controls for the tests, and improved sensitivity. However, it is too early to determine the significance of any positive impact from increased testing and the Company's product offerings on revenue, profitability and cash flow.

NOTE 8: MUTUAL FUND FEES

Investments in mutual funds are subject to sales charges in the form of front-end loads, back-end loads or 12b-1 fees. 12b-1 fees, which are ongoing fees allowable under Section 12b-1 of the Investment Company Act of 1940, are annual fees deducted to pay for marketing and distribution costs of the funds. These fees are deducted prior to the allocation of the Plan's investment earnings activity, and thus not separately identifiable as an expense.

NOTE 9: SUBSEQUENT EVENTS

The Coronavirus, Aid, Relief, and Economic Security (CARES) Act was signed into law on March 27, 2020. The Act includes an optional change related to the delay of participant loan repayments. The Act permits plan sponsors to allow qualifying participants to delay loan repayments that would otherwise be due between March 27, 2020 and December 31, 2020. All loan repayments due from the date the participant requests deferment through December 31, 2020 will be deferred. The Plan elected to adopt this optional change related to the delay of loan repayments.

ENZO BIOCHEM, INC. SALARY REDUCTION PLAN Schedule H, Line 4i Schedule of Assets (Held at End of Year) E.I.N. # 13-2866202 Plan # 001 December 31, 2019

Description of Investment Including Maturity Date, Rate of Interest, Collateral, Par or Maturit

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		Date, Rate of Interest, Collateral, Par or Maturity	Current Value
(a)	Identity of Issue, Borrower, Lessor or Similar Party (b)	Value (c)	(e)
*	Enzo Biochem, Inc.	Common Stock	\$ 2,961,454
	Pimco Total Return	Mutual Fund	300,051
	INVS DIVRS DIVD R5	Mutual Fund	259,492
	NB Genesis	Mutual Fund	503,896
	JPM Mid Cap Growth A	Mutual Fund	478,318
	WF SPL Small Cap Val A	Mutual Fund	576,512
	Columbia Acorn International Select	Mutual Fund	331,306
	TRP Div Growth Adv	Mutual Fund	218,220
	WFA Small Cap Growth Adm	Mutual Fund	169,069
	Parnassus Mid Cap	Mutual Fund	186,950
*	Fidelity Contrafund	Mutual Fund	2,739,924
*	Fidelity Capital & Income	Mutual Fund	825,044
*	Fidelity Government Income	Mutual Fund	273,416
*	Fidelity International Discovery	Mutual Fund	158,863
*	Fidelity Emerging Markets	Mutual Fund	245,458
*	Fidelity Growth Discovery	Mutual Fund	2,387,380
*	Fidelity Freedom Income	Mutual Fund	582
*	Fidelity Freedom Inc	Mutual Fund	115,906
*	Fidelity Freedom 2010	Mutual Fund	549,373
*	Fidelity Freedom 2020	Mutual Fund	3,086,595
*	Fidelity Freedom 2030	Mutual Fund	3,651,331
*	Fidelity Ext Market Inx	Mutual Fund	696,836
*			202,082
	Fidelity International Index	Mutual Fund	
*	Fidelity Govt MMKT	Mutual Fund	952,862
*	Fidelity 500 Index	Mutual Fund	2,003,290
*	Fidelity Freedom 2040	Mutual Fund	1,726,042
*	Fidelity Freedom 2005	Mutual Fund	87,982
*	Fidelity Freedom 2015	Mutual Fund	2,543,763
*	Fidelity Freedom 2025	Mutual Fund	3,101,375
*	Fidelity Freedom 2035	Mutual Fund	1,924,667
*	Fidelity Freedom 2045	Mutual Fund	959,413
*	Fidelity Freedom 2050	Mutual Fund	598,243
*	Fidelity US Bond IDX Adv	Mutual Fund	255,120
*	Fidelity Freedom 2055	Mutual Fund	288,039
*	Fidelity Freedom 2060	Mutual Fund	124,505
*	Fidelity Freedom 2065	Mutual Fund	418
*	Fidelity Cash Reserves	Mutual Fund	1,051
*	Notes receivable - participants	4.5% - 5.0%	766,493
			\$ 36,251,321

* Party-in-interest, as defined by ERISA

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, a trustee of the below named employee benefit plan has duly caused this annual report to be signed on its behalf by the undersigned hereunto duly authorized.

Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan

Date: August 12, 2020

/s/ Barry Weiner By: Barry Weiner Trustee

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement of Enzo Biochem, Inc. on Form S-8 (File No. 333-197028 and 333-236958) of our report dated August 12, 2020 on our audits of the financial statements of the Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan as of December 31, 2019 and 2018 and for the year ended December 31, 2019, and supplemental schedule as of December 31, 2019, which report is included in this Annual Report on Form 11-K to be filed on or about August 12, 2020.

/s/EisnerAmper LLP

EISNERAMPER LLP New York, New York August 12, 2020