

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, 2018

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, 2018 and 2017, and the related statement of changes in net assets available for benefits for the year ended December 31, 2018, 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, 2018 and 2017, and the changes in net assets available for benefits for the year ended December 31, 2018, 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, 2018 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
Iselin, New Jersey
June 28, 2019

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN

Statements of Net Assets Available for Benefits

December 31,

	<u>2018</u>	<u>2017</u>
ASSETS		
Investments, at fair value:		
Mutual funds	\$ 26,750,617	\$ 27,978,968
Enzo Biochem, Inc. common stock	2,516,906	7,366,086
	<u>29,267,523</u>	<u>35,345,054</u>
Receivables:		
Employer's contributions	829,689	784,585
Participants' contributions	66,885	61,790
Notes receivable – participants	660,890	744,372
	<u>1,557,464</u>	<u>1,590,747</u>
TOTAL ASSETS	<u>30,824,987</u>	<u>36,935,801</u>
NET ASSETS AVAILABLE FOR BENEFITS	<u>\$ 30,824,987</u>	<u>\$ 36,935,801</u>

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, 2018

Additions (deductions) from net assets attributed to:	
Investment income (loss):	
Interest and dividends	\$ 1,713,341
Net realized/unrealized depreciation in value of investments	(8,225,671)
Interest on notes receivable-participants	34,983
Contributions:	
Participants' contributions	2,211,260
Employer's contributions	829,689
Benefits paid to participants	(2,617,642)
Administrative expenses	<u>(56,775)</u>
Net decrease in net assets available for benefits	(6,110,814)
Net assets available for benefits, beginning of year	<u>36,935,801</u>
Net assets available for benefits, end of year	<u>\$ 30,824,987</u>

See notes to financial statements.

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN
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 (\$18,500 in 2018 and \$18,000 in 2017). 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 2018 and 2017, bringing those participants’ statutory maximum limitation to \$24,500 in 2018 and \$24,000 in 2017. In 2018, participant contributions totaled \$2,211,260 which includes \$31,813 in rollover contributions.

The Company may contribute to the Plan annually, a discretionary matching contribution and a non-elective employer contribution. For 2018 and 2017 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 2018, the total matching contributions were \$829,689 in the form of Enzo Biochem Inc. common stock. There were no non-elective employer contributions made in 2018 or 2017.

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 their contributions into various investment options offered by the Plan which include a choice of mutual funds and the common stock of Enzo Biochem, Inc. Contribution selections are designated by the participants. 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 or account balances, 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 are applied to reduce the Company’s future contributions to the Plan and pay Plan expenses. During the year ended December 31, 2018, forfeitures of \$42,710 were used to pay Plan expenses. Forfeited non-vested accounts available at December 31, 2018 and 2017 were \$66,473 and \$77,552, respectively.

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN
Notes to Financial Statements

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%. 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.

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 either a lump sum amount or in various annuity options. 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.

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN
Notes to Financial Statements

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.

Recent Accounting Pronouncements

In August, 2018, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update No. 2018-13 (“ASU 2018-13”), Fair Value Measurement (Topic 820) Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement. ASU 2018-13, eliminates, adds and modifies certain disclosure requirements for fair value measurements as part of its disclosure framework project. ASU 2018-13 is effective for fiscal years beginning after December 15, 2019 and interim periods within those fiscal years. The amendments on changes in unrealized gains and losses, the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and the narrative description of measurement uncertainty should be applied prospectively for only the most recent annual period presented in the year of adoption. All other amendments should be applied retrospectively to each period for which the financial statements are presented. Early adoption is permitted. An entity is permitted to early adopt any removed or modified disclosures and delay adoption of the additional disclosures until their effective date.

The Plan elected to adopt ASU 2018-13 as of and for the year ended December 31, 2018. The amendment has been applied prospectively and retrospectively to applicable amendments as defined above for all periods presented.

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, 2018 and 2017.

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.

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN
Notes to Financial Statements

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 Fair Value as of	
	December 31,	December 31,
	2018	2017
	Level 1	Level 1
Mutual funds	26,750,617	27,978,968
Common stock-Enzo Biochem, Inc.	2,516,906	7,366,086
	<u>\$ 29,267,523</u>	<u>\$ 35,345,054</u>

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 Corporate Plan for Retirement, a 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 (or asset) 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, 2018, there are no uncertain positions taken or expected to be taken that would require recognition of a liability or disclosure in the financial statements.

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN
Notes to Financial Statements

NOTE 6: RELATED PARTY AND PARTY IN INTEREST TRANSACTIONS

During 2018, the Plan purchased 153,268 shares of common stock of the Plan sponsor, at market prices totaling, \$841,908 and sold 151,720 shares of common stock at market prices totaling approximately \$858,158. At December 31, 2018 and 2017, the Plan held Enzo Biochem, Inc. common stock with a fair value of \$2,516,906 and shares owned of 905,362 and \$7,366,086 and shares owned of 903,814, respectively.

Fidelity Management Trust Company ("FMTC") is the trustee 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 \$23,610 for the year ended December 31, 2018. In addition the Plan paid for legal, advisory and auditing fees amounting to \$33,165 for the year ended December 31, 2018.

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, 2018 may not necessarily be indicative of amounts that could be realized in a current market exchange.

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.

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, 2018

(a)	Identity of Issue, Borrower, Lessor or Similar Party (b)	Description of Investment Including Maturity Date, Rate of Interest, Collateral, Par or Maturity Value (c)	Cost** (d)	Current Value (e)
*	Enzo Biochem, Inc.	Common Stock		\$ 2,516,906
	Pimco Total Return	Mutual Fund		337,899
	INVS DIVRS DIVD R5	Mutual Fund		296,386
	NB Genesis	Mutual Fund		384,366
	JPM Mid Cap Growth A	Mutual Fund		205,491
	WF SPL Small Cap Val A	Mutual Fund		425,793
	Columbia Acorn International Select	Mutual Fund		254,552
	TRP Div Growth Adv	Mutual Fund		81,530
	WFA Small Cap Growth Adm	Mutual Fund		130,951
*	Fidelity Fund	Mutual Fund		384,878
*	Fidelity Contrafund	Mutual Fund		2,018,827
*	Fidelity Capital & Income	Mutual Fund		688,269
*	Fidelity Government Income	Mutual Fund		168,092
*	Fidelity Leveraged Company	Mutual Fund		87,115
*	Fidelity International Discovery	Mutual Fund		130,676
*	Fidelity Emerging Markets	Mutual Fund		254,906
*	Fidelity Growth Discovery	Mutual Fund		1,296,197
*	Fidelity Freedom Income	Mutual Fund		163,398
*	Fidelity Freedom 2010	Mutual Fund		506,943
*	Fidelity Freedom 2020	Mutual Fund		2,983,657
*	Fidelity Freedom 2030	Mutual Fund		3,071,489
*	Fidelity Ext Market Inx	Mutual Fund		540,360
*	Fidelity International Index	Mutual Fund		181,147
*	Fidelity Govt MMKT	Mutual Fund		894,240
*	Fidelity 500 Index	Mutual Fund		1,635,792
*	Fidelity Freedom 2040	Mutual Fund		1,359,659
*	Fidelity Freedom 2005	Mutual Fund		72,880
*	Fidelity Freedom 2015	Mutual Fund		2,140,527
*	Fidelity Freedom 2025	Mutual Fund		2,933,640
*	Fidelity Freedom 2035	Mutual Fund		1,431,711
*	Fidelity Freedom 2045	Mutual Fund		744,504
*	Fidelity Freedom 2050	Mutual Fund		409,524
*	Fidelity US Bond IDX Adv	Mutual Fund	D	199,814
*	Fidelity Freedom 2055	Mutual Fund		266,940
*	Fidelity Freedom 2060	Mutual Fund		65,429
*	Fidelity Cash Reserves	Mutual Fund		1,020
*	Other receivables	Mutual Fund		2,015
*	Notes receivable - participants	4.5% - 5.0%	\$ 0	660,890
		Maturity through 11/2023		\$ 29,928,413

* Party-in-interest, as defined by ERISA

**Cost information omitted with respect to participant or beneficiary directed transactions.

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: June 28, 2019

/s/ James O'Brien

By: James M. O'Brien
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) of our report dated June 28, 2019 on our audits of the financial statements of Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan as of December 31, 2018 and 2017 and for the year ended December 31, 2018, and of the supplemental schedule as of December 31, 2018, which report is included in this Annual Report on Form 11-K to be filed on or about June 28, 2019.

/s/EISNERAMPER LLP

Iselin, New Jersey
June 28, 2019