

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

FORM 11-K

FOR ANNUAL REPORTS OF
EMPLOYEE STOCK REPURCHASE 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, 2006

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)

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ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN

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To the Trustees of
Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan

We have audited the accompanying statements of net assets available for benefits of Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan (the "Plan") as of December 31, 2006 and 2005, and the related statement of changes in net assets available for benefits for the year ended December 31, 2006. These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards as established by the Auditing Standards Board (United States) and in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Plan is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audit included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, 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. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the net assets available for benefits of the Plan as of December 31, 2006 and 2005, and the changes in net assets available for benefits for the year ended December 31, 2006 in conformity with accounting principles generally accepted in the United States of America.

Our audit was conducted for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplemental schedule of assets held for investment purposes at the end of the year, is presented for the purpose of additional analysis and is not a required part of the basic financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974. The supplemental schedule is the responsibility of the Plan's management. The supplemental schedule has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

June 26, 2007
Woodbury, New York

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ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN

STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS

DECEMBER 31,

	2006	2005
	-----	-----
ASSETS		
Cash	\$ 54,129	\$ 6,008
	-----	-----
Investments at fair value:		
Mutual funds	9,583,819	8,315,380
Common stock	2,251,720	1,643,178
Insurance contract	1,062,804	783,325
	-----	-----
	12,898,343	10,741,883
	-----	-----
Receivables:		
Employer's contributions	415,536	402,304
Participants' contributions	31,404	28,908
	-----	-----
	446,940	431,212
	-----	-----

Loans receivable - participants	175,842	233,700
	-----	-----
TOTAL ASSETS	13,575,254	11,412,803
	-----	-----
NET ASSETS AVAILABLE FOR BENEFITS	\$ 13,575,254	\$ 11,412,803
	=====	=====

See notes to financial statements.

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ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN

STATEMENT OF CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS

FOR THE YEAR ENDED DECEMBER 31, 2006

Additions to net assets attributed to:		
Participants' contributions		\$ 1,158,334
Employer's contributions		415,536
Rollover contributions		7,661
Interest on loans to participants		12,641
Net appreciation in fair value of investments:		
Mutual funds	\$ 1,219,063	
Common stock	305,392	1,524,455
	-----	-----
Total additions		3,118,627

Deductions from net assets attributed to:		
Benefits paid to participants		921,065
Administrative expenses		35,111

Total deductions		956,176

Net increase in net assets available for benefits		2,162,451
Net assets available for benefits, beginning of year		11,412,803

Net assets available for benefits, end of year		\$ 13,575,254
		=====

See notes to financial statements.

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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 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 three months 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 the maximum amount permitted by the Internal Revenue Code for each year (\$15,000 in 2006 and \$14,000 in 2005). Effective January 1, 2002, 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 \$5,000 in 2006, and \$4,000 in 2005, bringing those participants' statutory limitation to \$20,000 for 2006 and \$18,000 for 2005.

In addition, the Company will contribute to the Plan a discretionary matching contribution equal to 50% of the participant's 401(k) contribution, not to exceed 50% of 10% of the participant's annual compensation. Participants who have completed a year 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 for the year. In 2006 and 2005, the total matching contributions were \$415,536 and \$402,304, respectively, in the form of Enzo Biochem Inc. common stock.

Effective June 1, 2006, the Company amended the Plan's participant's salary reduction election. The amendment requires participants to make an initial salary deferral election, or an election to receive cash in lieu of a salary deferral election, within 30 days after entering the Plan. A participant's compensation will automatically be reduced by 3%, which will be considered to be the Participant's salary reduction election if the Participant does not elect to defer a portion of compensation or elect to receive cash in lieu of making a salary deferral election.

Participants' Accounts

Contributions are invested in a choice of mutual funds, a benefit responsive investment contract, 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, (b) Plan earnings, and 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.

Effective April 15, 2006, the Company amended the Plan to allow a Plan participant to elect to classify all or part of his or her elective deferrals as a Roth 401(k) deferral.

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN

NOTES TO FINANCIAL STATEMENTS

NOTE 1: PLAN DESCRIPTION (CONTINUED)

Vesting

Participants' contributed funds arising from salary reductions and the earnings thereon, are fully vested at all times. Vesting in the Company's matching contribution and earnings thereon, is ratable over four years of service. Any forfeited amounts shall be applied to reduce the Company's future contributions. For the years ended December 31, 2006 and 2005, the Company's contributions were reduced by forfeitures of approximately \$13,700 and \$11,200, respectively.

Loans to Participants

Participants may borrow from their 401(k) 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 are secured by the participant's vested account balance and bear a reasonable rate of interest. Principal and interest is paid ratably through payroll deductions.

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 property.

Operating Expenses

Certain operating expenses of the Plan are absorbed by the Plan Sponsor.

NOTE 2: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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.

The Plan's investments are stated at fair value. 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 comprising the respective mutual funds. 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 in fair value of its investments, which consists of the realized gains or losses and the unrealized appreciation (depreciation) on those investments.

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 and disclosures in the financial statements. Actual results could differ from those estimates.

NOTE 3: INVESTMENTS

The following table presents the fair values, as determined by quoted market price, of the investments except for the Metropolitan Life Stable Value Contract, which is presented at contract value, which approximates fair value:

	2006	2005
	-----	-----
Enzo Biochem, Inc.*	\$2,251,720	\$1,643,178
American Century Government Bond	\$ 290,796	\$ 266,421
American Funds AMCAP Fund CL A*	\$ 754,629	\$ 644,819
American Funds American Balanced Fund CL A*	\$1,327,293	\$1,436,346
American Funds Europacific Growth CL A*	\$1,709,274	\$1,410,406
American Funds Washington Mutual Investors Fund CL A*	\$2,610,689	\$2,299,358
Baron Growth Fund	\$ 148,728	\$ 112,259
Calamos Growth Fund CL A	\$ 493,974	\$ 470,628
Fidelity Contrafund*	\$ 974,288	\$ 823,150
Fidelity Spartan US Equity Index Fund	\$ 194,843	\$ 155,716
Freemont Bond Fund	\$ 163,272	\$ 75,272
Hotchkis & Wiley Mid Cap Value CL 1	\$ 340,975	\$ 193,168
Neuberger & Berman Genesis Fund Trust	\$ 422,533	\$ 378,051
Metropolitan Life Stable Value Contract (Note 4)*	\$1,062,804	\$ 783,325
Royce Total Return	\$ 151,114	\$ 49,786
American Funds US Gov't Securities Fund CL A	\$ 1,411	\$ --

* Denotes investments representing 5% or more of net assets

ENZO BIOCHEM, INC.
SALARY REDUCTION PROFIT SHARING PLAN

NOTES TO FINANCIAL STATEMENTS

NOTE 4: INVESTMENT CONTRACT WITH INSURANCE COMPANY

The Plan has a benefit-responsive investment contract with MetLife Trust Company, National Association (MetLife). MetLife maintains the contributions in separate accounts. The accounts are credited with earnings on the underlying investments and charged for participant withdrawals and administrative expenses. The contract is included in the financial statements at contract value as reported to the Plan by Counsel Trust Company. Contract value represents contributions made under the contract, plus earnings, less participant withdrawals and administrative expenses. Participants may ordinarily direct the withdrawal or transfer of all or a portion of their investment at contract value.

There are no reserves against contract value for credit risk of the contract issuer or otherwise and contract is estimated to approximate fair value. The average yield and crediting interest rates were approximately 4.5% and 4.1% for 2006 and 2005, respectively.

NOTE 5: 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.

NOTE 6: TAX STATUS

The Plan obtained its latest determination letter in February 2002 in which the Internal Revenue Service stated that the Plan was in compliance with the applicable requirements of the Internal Revenue Code. The Plan has been amended since receiving the determination letter. However, the plan administrator and the Plan's tax counsel believe that the Plan is currently designed and being operated in compliance with the applicable requirements of the Internal Revenue Code.

NOTE 7: PARTY IN INTEREST TRANSACTIONS

During 2006, the Plan purchased shares of common stock in Enzo Biochem, Inc., the parent company of the Plan sponsor, at market prices totaling approximately \$130,000. In addition, shares were sold, at market prices totaling approximately \$231,000. At December 31, 2006 and 2005, the Plan held Enzo Biochem, Inc. common stock with a fair value of \$2,251,720 and \$1,643,178, respectively.

Fees paid by the Plan to the third party Plan administrators amounted to \$33,211 for the year ended December 31, 2006.

NOTE 8: 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 statement of net assets available for benefits.

<TABLE>
<CAPTION>

(a)	(b)	(c)	(d)	(e)
IDENTITY OF ISSUE, BORROWER, LESSOR OR SIMILAR PARTY		DESCRIPTION OF INVESTMENT INCLUDING MATURITY DATE, RATE OF INTEREST, COLLATERAL, PAR OR MATURITY VALUE	COST	CURRENT VALUE
<S>	<C>	<C>	<C>	<C>
*	Enzo Biochem, Inc.	Common Stock		\$2,251,720
	American Century Government Bond	Mutual Fund		\$ 290,796
	American Funds AMCAP Fund CL A	Mutual Fund		\$ 754,629
	American Funds American Balanced Fund CL A	Mutual Fund		\$1,327,293
	American Funds Europacific Growth CL A	Mutual Fund		\$1,709,274
	American Funds Washington Mutual Investors Fund CL A	Mutual Fund		\$2,610,689
	Baron Growth Fund	Mutual Fund		\$ 148,728
	Calamos Growth Fund CL A	Mutual Fund		\$ 493,974
	Fidelity Contrafund	Mutual Fund		\$ 974,288
	Fidelity Spartan US Equity Index Fund	Mutual Fund		\$ 194,843
	Freemont Bond Fund	Mutual Fund		\$ 163,272
	Hotchkis & Wiley Mid Cap Value CL 1	Mutual Fund		\$ 340,975
	Neuberger & Berman Genesis Fund Trust	Mutual Fund		\$ 422,533
		Guaranteed Investment Contract		\$1,062,804
	Metropolitan Life Stable Value Contract	Contract		\$ 151,114
	Royce Total Return	Mutual Fund		\$ 1,411
	American Funds US Gov't Securities Fund CL A	Mutual Fund		\$ 175,842
	Participant Loans	5.00% - 11.00%	-0-	

</TABLE>

* Party-in-interest

See Independent Auditors' Report.

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SIGNATURES

THE PLAN. Pursuant to the requirements of the Securities Exchange Act of 1934, the trustees 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 26, 2007

/s/ Herbert Bass

By: Herbert Bass
Trustee

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Consent of Independent Registered Public Accounting Firm

To the Trustees of
Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan

We consent to incorporation of our report dated June 26, 2007 relating to the statements of net assets available for plan benefits of the Enzo Biochem, Inc. Salary Reduction Profit Sharing Plan as of December 31, 2006 and 2005 and the related statement of changes in net assets available for plan benefits for the year ended December 31, 2006; in the December 31, 2006 annual report on Form 11-K of Enzo Biochem, Inc.

Marks Paneth & Shron LLP
Woodbury, NY
June 26, 2007