

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

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FORM S-3  
REGISTRATION STATEMENT  
UNDER THE SECURITIES ACT OF 1933  
-----

ENZO BIOCHEM, INC.  
(EXACT NAME OF REGISTRANT AS SPECIFIED IN ITS CHARTER)

NEW YORK  
(STATE OR OTHER JURISDICTION OF  
INCORPORATION OR ORGANIZATION)

13-2866202  
(I.R.S. EMPLOYER  
IDENTIFICATION NUMBER)

527 MADISON AVENUE  
NEW YORK, NY 10022  
(212) 583-0100

(ADDRESS, INCLUDING ZIP CODE AND TELEPHONE NUMBER, INCLUDING AREA CODE, OF  
REGISTRANT'S PRINCIPAL EXECUTIVE OFFICES)

-----  
BARRY W. WEINER  
ENZO BIOCHEM, INC.  
527 MADISON AVENUE  
NEW YORK, NY 10022  
(212) 583-0100

(NAME, ADDRESS, INCLUDING ZIP CODE AND TELEPHONE NUMBER, INCLUDING AREA CODE, OF  
AGENT FOR SERVICE)

COPIES TO:  
ROBERT H. COHEN, ESQ.  
GREENBERG TRAURIG, LLP  
200 PARK AVENUE  
NEW YORK, NY 10166  
(212) 801-9200  
-----

APPROXIMATE DATE OF COMMENCEMENT OF PROPOSED SALE TO THE PUBLIC: From  
time to time after this Registration Statement becomes effective.

If the only securities being registered on this Form are being offered  
pursuant to dividend or interest reinvestment plans, please check the following  
box.

If any of the securities being registered on this Form are to be  
offered on a delayed or continuous basis pursuant to Rule 415 under the  
Securities Act of 1933, other than securities offered only in connection with  
dividend or interest reinvestment plans, check the following box.

If this Form is filed to register additional securities for an offering  
pursuant to Rule 462(b) under the Securities Act of 1933, please check the  
following box and list the Securities Act registration statement number of the  
earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule  
462(c) under the Securities Act of 1933, check the following box and list the  
Securities Act registration statement number of the earlier effective  
registration statement for the same offering.

If this Form is a registration statement pursuant to General  
Instruction I.D. or a post-effective amendment thereto that shall become  
effective upon filing with the Commission pursuant to Rule 462(e) under the  
Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement  
filed pursuant to General Instruction I.D. filed to register additional  
securities or additional classes of securities pursuant to Rule 413(b) under the  
Securities Act, check the following box.

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CALCULATION OF REGISTRATION FEE

<TABLE>  
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Title of Each Class of Securities to be Registered	Amount to be Registered	Proposed Maximum Offering Price Per Share (1)	Proposed Maximum Aggregate Offering Price (1)	Amount of Registration Fee
----- <S> Common Stock, \$0.01 par value per share </TABLE>	----- <C> 7,022,472	----- <C> \$14.24	----- <C> \$100,000,000	----- <C> \$10,700

(1) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c) of the Securities Act of 1933, based on the average of the high and low sales prices of the common stock, as reported on the New York Stock Exchange on October 31, 2006.

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THE REGISTRANT HEREBY AMENDS THIS REGISTRATION STATEMENT ON SUCH DATE OR DATES AS MAY BE NECESSARY TO DELAY ITS EFFECTIVE DATE UNTIL THE REGISTRANT SHALL FILE A FURTHER AMENDMENT WHICH SPECIFICALLY STATES THAT THIS REGISTRATION STATEMENT SHALL THEREAFTER BECOME EFFECTIVE IN ACCORDANCE WITH SECTION 8(a) OF THE SECURITIES ACT OF 1933 OR UNTIL THE REGISTRATION STATEMENT SHALL BECOME EFFECTIVE ON SUCH DATE AS THE COMMISSION, ACTING PURSUANT TO SAID SECTION 8(a), MAY DETERMINE.

THE INFORMATION IN THIS PROSPECTUS IS NOT COMPLETE AND MAY BE CHANGED. WE MAY NOT SELL THESE SECURITIES UNTIL THE REGISTRATION STATEMENT FILED WITH THE SECURITIES AND EXCHANGE COMMISSION IS EFFECTIVE. THIS PROSPECTUS IS NOT AN OFFER TO SELL THESE SECURITIES AND IS NOT SOLICITING AN OFFER TO BUY THESE SECURITIES IN ANY STATE WHERE THE OFFER OR SALE IS NOT PERMITTED.

SUBJECT TO COMPLETION, DATED NOVEMBER 3, 2006

PROSPECTUS

7,022,472 shares

[GRAPHIC OMITTED]

Enzo Biochem, Inc.

-----  
COMMON STOCK  
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We may, from time to time, offer up to \$100,000,000 in shares of our common stock.

Our common stock is listed on the New York Stock Exchange under the symbol "ENZ." On October 31, 2006, the last reported sale price of our common stock on the New York Stock Exchange was \$14.30 per share.

When we offer our common stock, we will provide specific terms of the offering in supplements to this prospectus. The common stock offered by this prospectus and any prospectus supplement may be offered directly or to or through underwriters or dealers. If any underwriters are involved in the sale of any common stock offered by this prospectus and any prospectus supplement, their names, and any applicable purchase price, fee, commission or discount arrangement between or among them, will be set forth, or will be calculable from the information set forth, in the applicable prospectus supplement.

You should read this prospectus and any prospectus supplement carefully before you invest in any of our securities.

INVESTING IN OUR COMMON STOCK INVOLVES RISK. SEE "RISK FACTORS" BEGINNING ON PAGE 3.

This prospectus may not be used to offer or sell any securities unless accompanied by a prospectus supplement.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES

COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

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THE DATE OF THIS PROSPECTUS IS , 2006.

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THIS PROSPECTUS IS A PART OF A REGISTRATION STATEMENT THAT WE FILED WITH THE SECURITIES AND EXCHANGE COMMISSION, OR SEC, USING A "SHELF" REGISTRATION PROCESS. UNDER THIS SHELF REGISTRATION PROCESS, WE MAY SELL SHARES OF OUR COMMON STOCK IN ONE OR MORE OFFERINGS UP TO 7,022,472 SHARES. ANY PROSPECTUS SUPPLEMENT THAT IS FILED IN CONNECTION WITH THE OFFERING OF THE SHARES INCLUDED IN THIS REGISTRATION STATEMENT MAY ALSO ADD, UPDATE OR CHANGE INFORMATION CONTAINED IN THIS PROSPECTUS. YOU SHOULD READ BOTH THIS PROSPECTUS AND ANY PROSPECTUS SUPPLEMENT TOGETHER WITH ADDITIONAL INFORMATION DESCRIBED UNDER THE HEADING "WHERE YOU CAN FIND MORE INFORMATION."

WE HAVE NOT AUTHORIZED ANY DEALER, SALESMAN OR OTHER PERSON TO GIVE ANY INFORMATION OR TO MAKE ANY REPRESENTATION OTHER THAN THOSE CONTAINED OR INCORPORATED BY REFERENCE IN THIS PROSPECTUS AND ANY ACCOMPANYING SUPPLEMENT TO THIS PROSPECTUS. YOU MUST NOT RELY UPON ANY INFORMATION OR REPRESENTATION NOT CONTAINED OR INCORPORATED BY REFERENCE IN THIS PROSPECTUS OR ANY ACCOMPANYING PROSPECTUS SUPPLEMENT. THIS PROSPECTUS AND ANY ACCOMPANYING SUPPLEMENT TO THIS PROSPECTUS DO NOT CONSTITUTE AN OFFER TO SELL OR THE SOLICITATION OF AN OFFER TO BUY ANY SECURITIES OTHER THAN THE REGISTERED SECURITIES TO WHICH THEY RELATE, NOR DO THIS PROSPECTUS AND ANY ACCOMPANYING SUPPLEMENT TO THIS PROSPECTUS CONSTITUTE AN OFFER TO SELL OR THE SOLICITATION OF AN OFFER TO BUY SECURITIES IN ANY JURISDICTION TO ANY PERSON TO WHOM IT IS UNLAWFUL TO MAKE SUCH OFFER OR SOLICITATION IN SUCH JURISDICTION. YOU SHOULD NOT ASSUME THAT THE INFORMATION CONTAINED IN THIS PROSPECTUS AND ANY ACCOMPANYING PROSPECTUS SUPPLEMENT IS ACCURATE ON ANY DATE SUBSEQUENT TO THE DATE SET FORTH ON THE FRONT OF THE DOCUMENT OR THAT ANY INFORMATION WE HAVE INCORPORATED BY REFERENCE IS CORRECT ON ANY DATE SUBSEQUENT TO THE DATE OF THE DOCUMENT INCORPORATED BY REFERENCE, EVEN THOUGH THIS PROSPECTUS AND ANY ACCOMPANYING PROSPECTUS SUPPLEMENT IS DELIVERED OR SECURITIES ARE SOLD ON A LATER DATE.

SUMMARY

The following summary provides an overview of certain information about our company and the offering and may not contain all the information that may be important to you. This summary is qualified in its entirety by and should be read together with the information contained in other parts of this prospectus. You should carefully read this entire prospectus before making a decision about whether to invest in our common stock.

ENZO BIOCHEM, INC.

OUR BUSINESS STRATEGY AND HISTORY

Our objective is to be a leading developer and provider of the tools and diagnostics used to study and detect disease at the molecular level and provider of therapeutic approaches to various diseases.

We are a life sciences and biotechnology company focused on harnessing genetic processes to develop research tools, diagnostics and therapeutics and a

provider of diagnostic services to the medical community. Since our founding in 1976, our strategic focus has been on the development, for commercial purposes, of enabling technologies in the life sciences field. Our pioneering work in genomic analysis coupled with our extensive patent estate and enabling platforms have strategically positioned us to play an important role in the rapidly growing life sciences and molecular medicine marketplaces.

We have built a substantial portfolio of intellectual property assets, with 211 issued patents worldwide, and more than 185 pending patent applications, along with extensive enabling technologies and platforms. We are applying our core technologies to develop novel therapeutics as well as research tools for the life sciences and clinical diagnostics markets. In addition, we provide clinical laboratory services to physicians and other health care providers in the greater New York area.

We are comprised of three interconnected operating companies that have evolved out of our core competence: the use of nucleic acids as informational molecules and the use of compounds for immune modulation. These wholly owned operating companies conduct their operations through three segments.

Below are brief descriptions of each of the three operating segments:

ENZO LIFE SCIENCES is a company that manufactures, develops and markets biomedical research products and tools to research and pharmaceutical customers around the world and has amassed a large patent and technology portfolio. The pioneering platforms developed by Enzo Life Sciences enable the development of a wide range of products in the research products marketplace.

ENZO THERAPEUTICS is a biopharmaceutical company 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. We have focused our efforts on developing treatment regimens for diseases and conditions in 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 40 patents and patent applications.

ENZO CLINICAL LABS is a regional clinical laboratory to the greater New York and New Jersey medical community. We believe having this capability allows us to capitalize firsthand on our extensive advanced molecular and cytogenetic capabilities and the broader trends in predictive diagnostics. We offer a menu of routine and esoteric clinical laboratory tests or procedures used in general patient care by physicians to establish or support a diagnosis, monitor treatment or medication, or search for an otherwise undiagnosed condition. We operate a full-service clinical laboratory in Farmingdale, New York, a network of 19 patient service centers, a stand alone "stat" or rapid response laboratory in New York City, and a full-service phlebotomy department.

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Our primary sources of revenue have historically been from sales and royalties of Life Sciences' products utilized in life science research and from the clinical laboratory services provided to the healthcare community.

Our offices are located at 527 Madison Avenue, New York, New York 10022, and our telephone number is (212) 583-0100.

#### RISK FACTORS

You should carefully consider the specific risks set forth under the caption "Risk Factors" in the applicable prospectus supplement and under the caption "Risk Factors" in any of our filings with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 incorporated by reference herein before making an investment decision. For more information, see "Where You Can Find More Information."

#### USE OF PROCEEDS

Unless otherwise specified in the applicable prospectus supplement, we intend to use the net proceeds from the sale of our shares of common stock offered by this prospectus for general corporate purposes, including without limitation, funding future acquisitions, the funding of our clinical research and development programs, the clinical development of our product candidates, capital expenditures and working capital needs.

#### PLAN OF DISTRIBUTION

We may sell our common stock to one or more underwriters for public offering and sale by them and may also sell our common stock to investors directly or through agents. We will name any underwriter or agent involved in the offer and sale of our common stock in the applicable prospectus supplement. We have reserved the right to sell or exchange our common stock directly to investors on our own behalf in those jurisdictions where we are authorized to do so.

We may distribute our common stock from time to time in one or more transactions:

- o at a fixed price or prices, which may be changed;
- o at market prices prevailing at the time of sale;
- o at prices related to such prevailing market prices; or
- o at negotiated prices.

We may also, from time to time, authorize dealers, acting as our agents, to offer and sell our common stock upon the terms and conditions set forth in the applicable prospectus supplement. In connection with the sale of our common stock, we or the purchasers of our common stock for whom the underwriters may act as agents may compensate underwriters in the form of underwriting discounts or commissions. Underwriters may sell our common stock to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for whom they may act as agent. Unless otherwise indicated in a prospectus supplement, an agent will be acting on a best efforts basis and a dealer will purchase our common stock as a principal, and may then resell our common stock at varying prices to be determined by the dealer.

We will describe in the applicable prospectus supplement any compensation we pay to underwriters or agents in connection with the offering of our common stock, and any discounts, concessions or commissions allowed by underwriters to participating dealers. Dealers and agents participating in the distribution of our common stock may be deemed to be underwriters, and any discounts and commissions received by them and

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any profit realized by them on resale of our common stock may be deemed to be underwriting discounts and commissions. We may enter into agreements to indemnify underwriters, dealers and agents against certain civil liabilities, including liabilities under the Securities Act, and to reimburse these persons for certain expenses.

To facilitate the offering of our common stock, certain persons participating in the offering may engage in transactions that stabilize, maintain, or otherwise affect the price of our common stock. This may include over-allotments or short sales of our common stock, which involve the sale by persons participating in the offering of more of our common stock than we sold to them. In these circumstances, these persons would cover such over-allotments or short positions by making purchases in the open market or by exercising their over-allotment option, if any. In addition, these persons may stabilize or maintain the price of our common stock by bidding for or purchasing our common stock in the open market or by imposing penalty bids, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if our common stock sold by them are repurchased in connection with stabilization transactions. The effect of these transactions may be to stabilize or maintain the market price of our common stock at a level above that which might otherwise prevail in the open market. These transactions, if commenced, may be discontinued at any time.

Certain of the underwriters, dealers or agents and their associates may engage in transactions with and perform services for us in the ordinary course of their business for which they receive compensation.

Any common stock sold pursuant to a prospectus supplement will be eligible for listing and trading on the New York Stock Exchange, subject to official notice of issuance.

#### DESCRIPTION OF CAPITAL STOCK

##### GENERAL MATTERS

Pursuant to our certificate of incorporation, as amended, the total amount of our authorized capital stock is 100,000,000 shares, which consists of 75,000,000 shares of authorized common stock, par value \$0.01 per share, and 25,000,000 shares of authorized preferred stock, par value \$0.01 per share. As of September 30, 2006, we had outstanding 32,274,500 shares of common stock and no shares of preferred stock.

According to the records of our transfer agent, American Stock Transfer & Trust Company, as of September 30, 2006, we had approximately 1,070 holders of record of our common stock.

The following summary of our capital stock does not purport to be complete and is subject to and qualified in its entirety by, our certificate of incorporation, as amended, and our bylaws.

## COMMON STOCK

The holders of shares of common stock are entitled to one vote for each share held of record on all matters submitted to a vote of the stockholders. All shares of our common stock are entitled to share equally in any dividends our board of directors may declare from legally available sources. Our common stock is traded on the New York Stock Exchange under the symbol "ENZ." The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company.

### CERTAIN PROVISIONS OF NEW YORK LAW AND OF THE COMPANY'S CHARTER AND BYLAWS

THE FOLLOWING PARAGRAPHS SUMMARIZE CERTAIN PROVISIONS OF THE NEW YORK BUSINESS CORPORATION LAW, OR NYBCL, AND OUR CERTIFICATE OF INCORPORATION AND BYLAWS. THE SUMMARY DOES NOT PURPORT TO BE COMPLETE AND IS SUBJECT TO AND QUALIFIED IN ITS ENTIRETY BY REFERENCE TO THE NYBCL AND TO OUR BYLAWS, COPIES OF WHICH ARE ON FILE WITH THE SEC AS EXHIBITS TO REGISTRATION STATEMENTS PREVIOUSLY FILED BY US. SEE "WHERE YOU CAN FIND MORE INFORMATION."

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GENERAL. Certain provisions of our certificate of incorporation and bylaws and New York law could make our acquisition by a third party, a change in our incumbent management, or a similar change of control more difficult, including:

- o an acquisition of us by means of a tender or exchange offer;
- o an acquisition of us by means of a proxy contest or otherwise; or
- o the removal of a majority or all of our incumbent officers and directors.

These provisions, which are summarized below, are likely to discourage certain types of coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that these provisions help to protect our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us, and that this benefit outweighs the potential disadvantages of discouraging such a proposal because our ability to negotiate with the proponent could result in an improvement of the terms of the proposal.

ELECTION AND REMOVAL OF DIRECTORS. Our bylaws provide that the size of the board of directors shall be fixed as determined from time to time by the board and shall be classified into three classes, as nearly equal as possible as determined by the board of directors. The directors are to be elected at the annual meeting of the stockholders, with a term expiring at the annual meeting of shareholders held in the third year following the year of their election or until his successor is elected and qualified. Any director or the entire board of directors may be removed, with cause, by a the affirmative vote of (i) the holders of 80% of the combined voting power of the then outstanding shares of stock entitled to vote generally in the election of directors, voting together as a single class and (ii) a majority of such shares beneficially owned by the persons not affiliated with an interested shareholder.

STOCKHOLDER MEETINGS. Our bylaws provide that the stockholders may not call a special meeting of the stockholders of our company. Instead, special meetings of the stockholders may be called by the Board of Directors and shall be called at the request in writing of a majority of the entire board of directors.

REQUIREMENTS FOR ADVANCE NOTIFICATION OF STOCKHOLDER NOMINATIONS AND PROPOSALS. Our bylaws establish advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board.

NEW YORK ANTI-TAKEOVER LAW. We are subject to certain "business combination" provisions of Section 912 of the NYBCL and expect to continue to be so subject if and for so long as we have a class of securities registered under Section 12 of the Securities Exchange Act of 1934. Section 912 provides, with certain exceptions (which include, among others, transactions with shareholders who became interested prior to the effective date of an amendment to our certificate of incorporation providing that we would be subject to Section 912 if such corporation did not then have a class of stock registered pursuant to Section 12 of the Exchange Act), that a New York corporation may not engage in a "business combination" (e.g., merger, consolidation, recapitalization or disposition of stock) with any "interested shareholder" for a period of five years from the date that such person first became an interested shareholder unless:

- (i) the transaction resulting in a person becoming an interested

shareholder was approved by the board of directors of the corporation prior to that person becoming an interested shareholder; or

(ii) the business combination is approved by the holders of a majority of the outstanding voting stock not beneficially owned by such interested shareholder; or

(iii) the business combination is approved by the disinterested shareholders at a meeting called no earlier than five years after the interested shareholder's stock acquisition date; or

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(iv) the business combination meets certain valuation requirements for the stock of a New York corporation.

An "interested stockholder" is defined as any person who (a) is the beneficial owner of 20% or more of the outstanding voting stock of a New York corporation or (b) is an affiliate or associate of a corporation that at any time during the prior five years was the beneficial owner, directly or indirectly, of 20% or more of the then outstanding voting stock.

A "business combination" includes mergers, asset sales and other transactions resulting in a financial benefit to the interested shareholder.

The "stock acquisition date," with respect to any person and any New York corporation, means the date that such person first becomes an interested shareholder of such corporation.

NO CUMULATIVE VOTING. Our certificate of incorporation and bylaws do not provide for cumulative voting in the election of directors.

LIMITATION OF LIABILITY. As permitted by the NYBCL, our certificate of incorporation provides that a director will not be personally liable to us or our stockholders for damages for any breach of duty in his or her capacity as a director unless a judgment or other final adjudication adverse to such director establishes that (i) his or her acts or omissions were in bad faith or involved intentional misconduct or a knowing violation of law, (ii) such director personally gained in fact a financial profit or other advantage to which he or she was not legally entitled or (iii) his or her acts violated Section 719 of the NYBCL. As a result of this provision, we and our stockholders may be unable to obtain monetary damages from a director for breach of his or her duty of care.

Our certificate of incorporation and bylaws also provide for the indemnification of our directors and officers to the fullest extent authorized by the NYBCL. Insofar as indemnification for liabilities under the Securities Act may be permitted to directors, officers or controlling persons of our company pursuant to our certificate of incorporation, our bylaws and the NYBCL, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

We have the power to purchase and maintain insurance on behalf of any person who is or was one of our directors or officers, or is or was serving at our request as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other business against any liability asserted against the person or incurred by the person in any of these capacities, or arising out of the person's fulfilling one of these capacities, and related expenses, whether or not we would have the power to indemnify the person against the claim under the provisions of the NYBCL. We intend to maintain director and officer liability insurance on behalf of our directors and officers.

#### LEGAL MATTERS

The validity of the issuance of the shares of our common stock described herein has been passed upon for us by Greenberg Traurig, LLP, New York, New York. Shareholders of Greenberg Traurig, LLP beneficially own in the aggregate 62,846 shares of our common stock.

#### EXPERTS

The consolidated financial statements of Enzo Biochem, Inc. appearing in Enzo Biochem, Inc.'s Annual Report (Form 10-K) for the year ended July 31, 2006 and Enzo Biochem, Inc. management's assessment of the effectiveness of internal control over financial reporting as of July 31, 2006 included therein, have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their reports thereon included therein, and incorporated herein by reference. Such financial statements and management's assessment have been incorporated herein by reference in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

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## INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" the information we file with them, which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus. The information incorporated by reference is considered to be part of this prospectus, and later information that we file with the SEC will automatically update and supersede this information. We incorporate by reference the document listed below and any future filings made with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act between the date of this prospectus and the termination of the offering and also between the date of the initial registration statement and prior to effectiveness of the registration statement:

- o Our Annual Report on Form 10-K for the fiscal year ended July 31, 2006 filed on October 13, 2006.

This prospectus is part of a registration statement on Form S-3 we have filed with the SEC under the Securities Act. This prospectus does not contain all of the information in the registration statement. We have omitted certain parts of the registration statement, as permitted by the rules and regulations of the SEC. You may inspect and copy the registration statement, including exhibits, at the SEC's public reference room or website. Our statements in this prospectus about the contents of any contract or other document are not necessarily complete. You should refer to the copy of each contract or other document we have filed as an exhibit to the registration statement for complete information.

You may request a copy of any or all of the information incorporated by reference, at no cost, by writing or telephoning us at the following address:

Enzo Biochem, Inc.  
527 Madison Avenue  
New York, New York 10022  
(212) 583-0100

## WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC's public reference room located at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. Our filings with the SEC are also available to the public at the SEC's website at <http://www.sec.gov>. You may also obtain copies of the documents at prescribed rates by writing to the SEC's Public Reference Section at 100 F Street, N.E., Washington, D.C. 20549. Our website is located at [www.enzo.com](http://www.enzo.com). The contents of our website are not part of this prospectus and should not be relied upon with respect thereto.

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the documents that we incorporate by reference, contains forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended. Any statements about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. These statements are often, but not always, made through the use of words or phrases such as "anticipate," "estimate," "plans," "projects," "continuing," "ongoing," "expects," "management believes," "we believe," "we intend" and similar words or phrases. Accordingly, these statements involve estimates, assumptions and uncertainties which could cause actual results to differ materially from those expressed in them. Any forward-looking statements are qualified in their entirety by reference to the factors discussed in this prospectus or incorporated by reference.

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Forward-looking statements are subject to known and unknown risks and uncertainties that could cause actual results to differ materially from those expected or implied by the forward-looking statements. Our actual results could differ materially from those anticipated in the forward-looking statements for many reasons, including the factors described in the section entitled "Risk Factors" in this prospectus.

You should not unduly rely on these forward-looking statements, which speak only as of the date on which it is made. We undertake no obligation to publicly revise any forward-looking statement to reflect circumstances or events after the date of this prospectus or to reflect the occurrence of unanticipated events. You should, however, review the factors and risks we describe in the reports we file from time to time with the SEC after the date of this prospectus. The reports we file from time to time with the SEC are available to the public over the Internet at the SEC's website <http://www.sec.gov> as described under the heading "Where You Can Find More Information."

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT  
LIABILITIES

NEW YORK BUSINESS CORPORATION LAW

Sections 721 through 726 of the NYBCL provide that, in certain circumstances, a corporation may indemnify its directors and officers against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with any threatened, pending or completed actions, suits or proceedings in which such person is made a party by reason of such person being or having been a director or officer to the company, if such director or officer (i) acted, in good faith, for a purpose which he or she reasonably believed to be in or not opposed to the best interests of the corporation and (ii) in criminal actions or proceedings, had no reasonable cause to believe that his or her conduct was unlawful; provided, however, that no indemnification may be provided where a final adjudication adverse to the director or officer establishes that his or her actions were committed in bad faith or where the result of active and deliberate dishonesty and were material to the cause of action adjudicated, or that he or she personally gained a financial profit or other advantage to which he or she was not legally entitled. A corporation is required to indemnify against reasonable expenses (including attorney's fees) incurred by any director or officer who successfully defends any such action. The NYBCL also provides for indemnification of officers and directors in actions by or in the right of the corporation, subject to certain exceptions. Indemnification provided by these provisions of the NYBCL is not exclusive of any other rights to which a director or officer may be entitled.

CERTIFICATE OF INCORPORATION

Article 8 of the certificate of incorporation, as amended, of the company provides that the personal liability of the directors of the company shall be eliminated to the fullest extent permitted by the provisions of Article 7 of the NYBCL, as the same may be amended and supplemented.

Article 8 of the certificate of incorporation, as amended, of the company provides that company shall, to the fullest extent permitted by the provisions of Article 7 of the NYBCL, as the same may be amended and supplemented, indemnify any and all persons whom it shall have power to indemnify under said section from and against any and all of the expenses, liabilities or other matters referred to in or covered by said section, and the indemnification provided for therein shall not be deemed exclusive of any other rights to which those indemnified may be entitled under any bylaw, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in his official capacity and as to action in another capacity while holding such office, and shall continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such person.

LIABILITY INSURANCE

We have also obtained directors' and officers' liability insurance, which insures against liabilities that our directors or officers may incur in such capacities.

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COMMISSION POSITION ON INDEMNIFICATION

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to our directors, officers and or persons controlling the company pursuant to the foregoing provisions, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

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[GRAPHIC OMITTED]

ENZO BIOCHEM, INC.

Common Stock

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PROSPECTUS  
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PART II  
 INFORMATION NOT REQUIRED IN PROSPECTUS

ITEM 14. OTHER EXPENSES OF DISTRIBUTION

The following table lists the costs and expenses payable by the registrant in connection with the sale of the common stock covered by this prospectus other than any sales commissions or discounts, which expenses will be paid by us. All amounts shown are estimates except the SEC registration fee.

SEC registration fee	\$10,700
Legal fees and expenses	60,000
Accounting fees and expenses	20,000
Miscellaneous fees and expenses	300
Total	\$91,000

ITEM 15. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Enzo Biochem, Inc. is incorporated under the laws of the State of New York. Reference is made to Section 721 of the New York Business Corporation Law, or NYBCL, which enables a corporation in its original certificate of incorporation or an amendment thereto to eliminate or limit the personal liability of a director for violations of the director's fiduciary duty, except if (1) his or her acts or omissions were in bad faith or involved intentional misconduct or a knowing violation of law, (2) such director personally gained in fact a financial profit or other advantage to which or she was not legally entitled, or (3) his or her acts violated Section 719 of the NYBCL.

Reference is also made to Section 722 of the NYBCL, which provides that a corporation may indemnify any person, including an officer or director, who is, or is threatened to be made, party to any threatened, pending or completed legal action or proceeding, whether civil or criminal, other than an action by or in the right of such corporation, by reason of the fact that such person was an officer, director, employee or agent of such corporation or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided such officer, director, employee or agent acted in good faith and in a manner he reasonably believed to be in, or not opposed to, the corporation's best interest and, for criminal proceedings, had no reasonable cause to believe that his conduct was unlawful. A New York corporation may indemnify any officer or director in an action by or in the right of the corporation under the same conditions, except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him against the expenses that such officer or director actually and reasonably incurred.

Our certificate of incorporation and bylaws provide for indemnification of the officers and directors to the full extent permitted by applicable law.

We have also obtained directors' and officers' liability insurance, which insures against liabilities that our directors or officers may incur in such capacities.

ITEM 16. EXHIBITS

EXHIBIT  
 NUMBER  
 - - - - -

- 4.1 Common Stock Specimen Certificate (incorporated by reference to Exhibit 4.6 to the registration statement on Form S-8 of Enzo Biochem, Inc. (No. 333-123712))
- 5.1 Opinion of Greenberg Traurig, LLP, counsel to the registrant
- 23.1 Consent of Independent Registered Public Accounting Firm

23.2 Consent of Greenberg Traurig, LLP (contained in Exhibit 5.1)

24.1 Power of attorney (contained on signature page)

ITEM 17. UNDERTAKINGS

(a) The undersigned registrant, hereby undertakes:

(1) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(2) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(3) That for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(a) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement, and

(b) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date

(4) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities

to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(a) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(b) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(c) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(d) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) The undersigned registrant hereby further undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing

of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) The undersigned registrant hereby undertakes to deliver or cause to be delivered with the prospectus, to each person to whom the prospectus is sent or given, the latest annual report to security holders that is incorporated by reference in the prospectus and furnished pursuant to and meeting the requirements of Rule 14a-3 or Rule 14c-3 under the Securities Exchange Act of 1934; and, where interim financial information required to be presented by Article 3 of Regulation S-X are not set forth in the prospectus, to deliver, or cause to be delivered to each person to whom the prospectus is sent or given, the latest quarterly report that is specifically incorporated by reference in the prospectus to provide such interim financial information.

(d) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the provisions described in the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

#### SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of New York, State of New York, on this 3rd day of November 2006.

ENZO BIOCHEM, INC.

By: /s/ Elazar Rabbani

-----

Name: Elazar Rabbani, Ph.D.  
Title: Chairman and Chief  
Executive Officer

#### POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENT, that each person whose signature appears below constitutes and appoints Elazar Rabbani and Barry W. Weiner, and each or either of them, his true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments or any abbreviated registration statement and any amendments thereto filed pursuant to Rule 462(b) increasing the number of securities for which registration is sought) to this Registration Statement, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated

<TABLE>

<CAPTION>

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<C>

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/s/ Elazar Rabbani

Chairman and Chief Executive Officer  
(Principal Executive Officer)

November 3, 2006

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Elazar Rabbani, Ph.D.

/s/ Shahram K. Rabbani ----- Shahram K. Rabbani	Chief Operating Officer, Secretary and Director	November 3, 2006
/s/ Barry W. Weiner ----- Barry W. Weiner	President, Chief Financial Officer and Director (Principal Accounting and Financial Officer)	November 3, 2006
/s/ John B. Sias ----- John B. Sias	Director	November 3, 2006
/s/ John J. Delucca ----- John J. Delucca	Director	November 3, 2006
/s/ Irwin C. Gerson ----- Irwin C. Gerson	Director	November 3, 2006
/s/ Melvin F. Lazar ----- Melvin F. Lazar	Director	November 3, 2006

</TABLE>

EXHIBIT INDEX

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23.2	Consent of Greenberg Traurig, LLP (contained in Exhibit 5.1)
24.1	Power of attorney (contained on signature page)

[GREENBERG TRAURIG, LLP LETTERHEAD]

November 3, 2006

Enzo Biochem, Inc.  
 527 Madison Avenue  
 New York, New York 10022

Re: Registration Statement on Form S-3  
 of Enzo Biochem, Inc.  
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Ladies and Gentlemen:

We have acted as counsel to Enzo Biochem, Inc., a New York corporation (the "Company"), in connection with the proposed issuance of up to \$100,000,000 aggregate offering price of shares of common stock (the "Shares"), par value \$.01 per share (the "Common Stock"), pursuant to a registration statement on Form S-3 under the Securities Act of 1933, as amended, (the "Act"), filed with the Securities and Exchange Commission (the "Commission") on October 31, 2006 (the "Registration Statement"), which includes the prospectus (the "Prospectus"). The Prospectus provides that it will be supplemented in the future by one or more supplements to the Prospectus (each a "Prospectus Supplement"). This opinion is being furnished in accordance with the requirements or Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or the prospectus included therein, other than as to the validity of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon the foregoing and upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters.

We are opining herein only as to the Business Corporation Law of the State of New York, and we express no opinion with respect to the applicability thereto, or the effect thereon, of any other laws.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, when the Registration Statement and any required post-effective amendments thereto have become effective under the Act and any and all Prospectus Supplement(s) required by applicable laws have been delivered and filed as required by such laws, and upon adoption by the Board of Directors of the Company of a resolution in form and content as required by applicable law and upon issuance and delivery of and payment of legal consideration in excess of the par value thereof for the Shares in the manner contemplated by the Registration Statement, the Prospectus and the related Prospectus Supplement(s) and by such resolution, and assuming that at the time of the issuance of such Shares, the Company has a sufficient number of authorized but unissued shares of Common Stock under its Certificate of Incorporation, as amended, the issuance and sale of the Shares will be duly authorized by all necessary corporate action of the Company, and the Shares will be validly issued, fully paid and nonassessable.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of

federal securities laws. We consent to your filing this opinion as an exhibit to the Registration Statement and to the reference to our firm in the prospectus under the heading "Legal Matters." In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the ruled and regulations of the Commission thereunder.

Very truly yours,

/s/ Greenberg Traurig, LLP

GREENBERG TRAURIG, LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the reference to our firm under the caption "Experts" in this Registration Statement (Form S-3) and related Prospectus of Enzo Biochem, Inc. for the registration of shares of its common stock and to the incorporation by reference therein of our reports dated October 5, 2006, with respect to the consolidated financial statements and schedule of Enzo Biochem, Inc., Enzo Biochem, Inc. management's assessment of the effectiveness of internal control over financial reporting, and the effectiveness of internal control over financial reporting of Enzo Biochem, Inc., included in its Annual Report (Form 10-K) for the year ended July 31, 2006, filed with the Securities and Exchange Commission.

/s/ Ernst and Young LLP  
Melville, New York  
October 30, 2006