

PROSPECTUS SUPPLEMENT
(To Prospectus dated December 8, 2006)

3,285,715 shares



Enzo Biochem, Inc.

Common Stock

We are offering up to 3,285,715 shares of our common stock to one or more selected investors pursuant to this prospectus supplement and the accompanying prospectus. The common stock will be purchased at the negotiated price of \$14.00 per share.

Our common stock is listed on the New York Stock Exchange under the symbol "ENZ." On December 14, 2006, the last reported sale price of the common stock on the New York Stock Exchange was \$15.30 per share.

Investing in our common stock involves significant risks. See "Risk Factors" beginning on page S-3.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities, or determined if this prospectus supplement or the accompanying prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

We have retained Lazard Capital Markets LLC to act as placement agent for us in connection with the shares offered by this prospectus supplement.

	Per Share	Maximum Offering Amount
Public offering price	\$ 14.00	\$ 46,000,010
Placement agent's fees	\$ 0.77	\$ 2,530,000
Proceeds, before expenses, to us	\$ 13.23	\$ 43,470,010

We estimate the total expenses of this offering, excluding the placement agent's fee, will be approximately \$365,000. The placement agent is not required to sell any specific number or dollar amount of the shares of common stock offered by this offering, but will use its commercially reasonable efforts to sell the shares of common stock offered. Pursuant to an escrow agreement among us, the placement agent and an escrow agent, a portion of the funds received in payment for the shares sold in this offering will be deposited into an interest-bearing escrow account and held until we and the placement agent notify the escrow agent that the offering has closed, indicating the date on which the shares are to be delivered to the purchasers and the proceeds are to be delivered to us. Because there is no minimum offering amount required as a condition to closing in this offering, the actual public offering amount, placement agent's fee and net proceeds to us, if any, in this offering are not presently determinable and may be substantially less than the maximum offering amounts set forth above.

LAZARD CAPITAL MARKETS

The date of this prospectus supplement is December 14, 2006.

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PROSPECTUS

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This document is in two parts. The first part is this prospectus supplement, which describes the terms of the offering of common stock and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into the accompanying prospectus. The second part is the accompanying prospectus, which provides more general information. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information

contained in the accompanying prospectus or any document incorporated by reference therein, on the other hand, you should rely on the information in this prospectus supplement.

You should rely only on the information contained in this prospectus supplement and contained, or incorporated herein by reference, in the accompanying prospectus. We have not authorized anyone to provide you with information that is different. We are offering to sell, and seeking offers to buy, shares of common stock only in jurisdictions where offers and sales are permitted. The information contained, or incorporated by reference, in this prospectus supplement and contained, or incorporated herein by reference, in the accompanying prospectus is accurate only as of the respective dates thereof, regardless of the time of delivery of this prospectus supplement and the accompanying prospectus, or of any sale of the common stock. It is important for you to read and consider all information contained in this prospectus supplement and the accompanying prospectus, including the documents we have referred you to in the section entitled "Where You Can Find More Information" below in this prospectus supplement.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights information contained in other parts of this prospectus supplement and the accompanying prospectus. Because it is a summary, it does not contain all of the information that you should consider before investing in our common stock. You should read this entire prospectus supplement and the accompanying prospectus carefully, including the "Risk Factors," and the financial statements and other information incorporated by reference in this prospectus supplement and the accompanying prospectus.

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.

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.

The Offering

Common stock offered by Enzo Biochem, Inc.

We are offering up to 3,285,715 shares of our common stock to selected investors at a negotiated purchase price of \$14.00 per share.

Common stock to be outstanding after this offering

Up to 35,571,215 shares.

Use of proceeds

We intend to use the net proceeds of this offering 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. See "Use of Proceeds."

New York Stock Exchange symbol

ENZ

Unless otherwise noted in this prospectus supplement, all information in this prospectus assumes no exercise of any of the options to purchase 2,866,576 shares of our common stock at a weighted average exercise price per share of \$13.20 issued pursuant to our 2005 Equity Compensation Incentive Plan, as of October 31, 2006.

As used in this prospectus, "we," "our," "us" and "the company" refers to Enzo Biochem, Inc.

RISK FACTORS

Any investment in our shares of common stock involves a high degree of risk. You should consider carefully the following information about these risks, together with the other information contained in this prospectus supplement, the accompanying prospectus and the specific risks set forth 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." If any of the risks actually occur, our business, results of operations and financial condition would likely suffer. In these circumstances, the market price of our common stock could decline and you may lose all or part of the money you paid to buy our common stock.

Risks Related to the Offering and the Common Stock

Our stock price may be volatile, and our stockholders' investment in our stock could decline in value.

The market prices for our securities and those of other life sciences companies have been highly volatile and may continue to be highly volatile in the future. The following factors, in addition to other risk factors described in this section, may have a significant impact on the market price of our common stock:

- the receipt or failure to receive the additional funding necessary to conduct our business;
- the progress and success of preclinical studies and clinical trials of our product candidates conducted by us or our future collaborative partners or licensees, if any;
- selling by large stockholders;

- announcements of technological innovations or new commercial products by our competitors or us;
- developments concerning proprietary rights, including patents;
- developments concerning any future collaborations;
- publicity regarding actual or potential medical results relating to products under development by our competitors or us;
- regulatory developments in the United States and foreign countries;
- litigation;
- economic and other external factors or other disaster or crisis; and
- period-to-period fluctuations in financial results.

We do not intend to pay regular dividends on our common stock for the foreseeable future.

We do not expect for the foreseeable future to pay regular dividends on our common stock. If and when we ever receive proceeds from the sale or partnership of any of our programs, and depending on our then-current capital needs, we will consider returning transaction proceeds to our investors through special dividends or stock repurchases. However, any future determination to pay dividends on or repurchase shares of our common stock will be at the discretion of our board of directors and will depend upon, among other factors, our success in completing sales or partnerships of our programs, our results of operations, financial condition, capital requirements, contractual restrictions and applicable law.

FORWARD-LOOKING STATEMENTS

This prospectus includes forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. All statements other than statements of historical facts contained in this prospectus, including statements regarding our future financial position, business strategy and plans and objectives of management for future operations, are forward-looking statements. The words “believe,” “may,” “estimate,” “continue,” “anticipate,” “intend,” “expect,” “suggest,” “should,” “forecast,” “could,” “plan” and similar expressions, as they relate to us, are intended to identify forward-looking statements. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions described in “Risk Factors” and elsewhere in this prospectus, including, among other things: (1) our ability to successfully conduct clinical and preclinical trials for our product candidates, (2) our ability to raise additional capital on favorable terms, (3) our ability to identify and acquire additional product candidates, and (4) our ability to execute our business plan on time and on budget. These risks are not exhaustive. Other sections of this prospectus include additional factors which could adversely impact our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for our management to predict all risk factors, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. You should not rely upon forward-looking statements as predictions of future events. We cannot assure you that the events and circumstances reflected in the forward-looking statements will be achieved or occur and actual results could differ materially from those projected in the forward-looking statements.

USE OF PROCEEDS

We estimate that the net proceeds to us from this offering will be approximately \$43,105,010 based on a public offering price of \$14.00 per share, and after deducting the placement agency commission and estimated offering expenses payable by us. "Net proceeds" is what we expect to receive after paying the placement agent fees and other expenses of the offering. Because there is no minimum offering amount required as a condition to closing this offering, the actual public offering amount, placement fees and proceeds to us, if any, are not presently determinable and may be substantially less than the maximum amount set forth above. We intend to use these net proceeds 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 are offering the shares of common stock through Lazard Capital Markets LLC as our placement agent. Subject to the terms and conditions contained in the placement agent agreement, dated December 14, 2006, Lazard Capital Markets LLC has agreed to act as our placement agent for the sale of up to 3,285,715 shares of our common stock. The placement agent is not purchasing or selling any shares by this prospectus supplement and the accompanying prospectus, nor is it required to arrange the purchase or sale of any specific number or dollar amount of the shares, but has agreed to use its commercially reasonable efforts to arrange for the sale of all 3,285,715 of the shares.

The placement agent agreement provides that the obligations of the placement agent and the investors are subject to certain conditions precedent, including the absence of any material adverse change in our business and the receipt of certain customary opinions, letters and certificates.

Confirmations and definitive prospectuses will be distributed to all investors who agree to purchase the common stock, informing investors of the closing date as to such shares. We currently anticipate that closing of the sale of 3,285,715 shares of common stock will take place on or about December 20, 2006. Investors will also be informed of the date and manner in which they must transmit the purchase price for their shares.

On the scheduled closing date, the following will occur:

- we will receive funds in the amount of the aggregate purchase price; and
- Lazard Capital Markets LLC will receive the placement agent's fee in accordance with the terms of the placement agent agreement.

We will pay the placement agent a commission equal to 5.5% of the gross proceeds of the sale of shares of common stock in the offering. We may also reimburse the placement agent for certain legal expenses incurred by it. In no event will the total amount of compensation paid to the placement agent and other securities brokers and dealers upon completion of this offering exceed 8% of the gross proceeds of the offering. The estimated offering expenses payable by us, in addition to the placement agent's fee of \$2,530,000, are approximately \$365,000, which includes legal, accounting and printing costs and various other fees associated with registering and listing the common stock. After deducting certain fees due to the placement agent and our estimated offering expenses, we expect the net proceeds from this offering to be approximately \$43,105,010. Lazard Frères & Co. LLC referred this transaction to Lazard Capital Markets LLC and will receive a referral fee from Lazard Capital Markets LLC in connection therewith.

We have agreed to indemnify the placement agent and Lazard Frères & Co. LLC against certain liabilities, including liabilities under the Securities Act of 1933, as amended, and liabilities arising from breaches of representations and warranties contained in the placement agent agreement. We have also agreed to contribute to payments the placement agent and Lazard Frères & Co. LLC may be required to make in respect of such liabilities.

We, along with our executive officers and directors, have agreed to certain lock-up provisions with regard to future sales of our common stock for a period of ninety (90) days after the offering as set forth in the placement agent agreement.

The placement agent agreement with Lazard Capital Markets LLC is included as an exhibit to our Current Report on Form 8-K that will be filed with the Securities and Exchange Commission in connection with the consummation of this offering.

The placement agent has informed us that it will not engage in over-allotment, stabilizing transactions or syndicate covering transactions in connection with this offering.

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. Thelen Reid Brown Raysman & Steiner LLP, New York, New York, is counsel for the placement agent in connection with this offering.

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.

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. The contents of our website are not part of this prospectus and should not be relied upon with respect thereto.

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 supplement and the accompanying 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 documents listed below and any future filings made with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended between the date of this prospectus supplement and the termination of the offering and also between the date of the initial registration statement and prior to effectiveness of the registration statement:

- Our Annual Report on Form 10-K for the fiscal year ended July 31, 2006 filed on October 13, 2006.
- Our Quarterly Report on Form 10-Q for the fiscal quarter ended October 31, 2006 filed on December 11, 2006.

- Our Current Reports on Form 8-K filed on October 13, 2006, November 13, 2006, November 17, 2006 and December 11, 2006.
- Our definitive Proxy Statement on Schedule 14A filed on November 27, 2006.

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, NY 10022
(212) 583-0100

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7,022,472 shares



Enzo Biochem, Inc.

COMMON STOCK

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.

The date of this prospectus is December 8, 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.

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:

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

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."

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:

- an acquisition of us by means of a tender or exchange offer;
- an acquisition of us by means of a proxy contest or otherwise; or
- 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

(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.

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:

- 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. 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.

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 ACTLIABILITIES

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.

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.

3,285,715 Shares



Common Stock

PROSPECTUS SUPPLEMENT

LAZARD CAPITAL MARKETS

December 14, 2006
