

PROSPECTUS SUPPLEMENT
(to the prospectus dated August 5, 2010)



275,000 Shares of Common Stock

We are offering 275,000 shares of our common stock to our legal counsel, Greenberg Traurig, LLP, pursuant to this prospectus supplement and the accompanying prospectus. The shares to be offered pursuant to this prospectus supplement were issued in satisfaction of \$500,000 of outstanding legal fees owed by us to Greenberg Traurig, LLP. Based on the closing price of our common stock of \$1.73 on the New York Stock Exchange on June 26, 2012, which was the last trading day prior to the day of the offering, the shares issued had an aggregate value of \$475,750.

Our common stock is listed on the New York Stock Exchange under the symbol "ENZ." On June 28, 2012, the last reported sale price of the common stock on the New York Stock Exchange was \$1.70 per share.

Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should review carefully the risks and uncertainties described under the heading "Risk Factors" on page S-5 of this 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 supplement or the accompanying prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is June 29, 2012.

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No dealer, salesperson or other person is authorized to give any information or to represent anything not contained in this prospectus supplement or the accompanying prospectus. You must not rely on any unauthorized information or representations. This prospectus supplement and the accompanying prospectus are an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus supplement and the accompanying prospectus is current only as of their respective dates.

ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying base prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or SEC, utilizing a “shelf” registration process. Each time we sell securities under the accompanying base prospectus we will provide a prospectus supplement that will contain specific information about the terms of that offering, including the price, the amount of securities being offered and the plan of distribution. The shelf registration statement was filed with the SEC on July 2, 2010, and was declared effective by the SEC on August 5, 2010. This prospectus supplement describes the specific details regarding this offering, including the price, the amount of common stock being offered, and the risks of investing in our common stock. The accompanying base prospectus provides general information about us, some of which, such as the section entitled “Plan of Distribution,” may not apply to this offering.

If information in this prospectus supplement is inconsistent with the accompanying base prospectus or the information incorporated by reference, you should rely on this prospectus supplement. This prospectus supplement, together with the base prospectus and the documents incorporated by reference into this prospectus supplement and the base prospectus, includes all material information relating to this offering. We have not authorized anyone to provide you with different or additional information. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, and the documents incorporated by reference in this prospectus supplement and the accompanying prospectus is accurate only as of the respective dates of those documents. Our business, financial condition, results of operations and prospects may have changed since those dates. **You should carefully read this prospectus supplement, the base prospectus, the information and documents incorporated herein by reference and the additional information under the heading “Where You Can Find More Information” before making an investment decision.**

PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus supplement, the accompanying base prospectus and the documents incorporated by reference. This summary does not contain all of the information that you should consider before deciding to invest in our securities. You should read this entire prospectus supplement and the accompanying base prospectus carefully, including the section entitled "Risk Factors" beginning on page S-5 and our consolidated financial statements and the related notes and the other information incorporated by reference into this prospectus supplement and the accompanying prospectus before making an investment decision.

OUR BUSINESS

We are a growth-oriented integrated life sciences and biotechnology company focused on harnessing biological processes to develop research tools, diagnostics and therapeutics and serves as a provider of test services, including esoteric tests, to the medical community. Since our founding in 1976, our strategic focus has been on the development of enabling technologies in research, development, manufacture, licensing and marketing of innovative health care products, platforms and services based on molecular and cellular technologies. Our pioneering work in genomic analysis coupled with its extensive patent estate and enabling platforms have strategically positioned the Company to play an important role in the rapidly growing life sciences and molecular medicine marketplaces.

In the course of our research and development activities, we have built a substantial portfolio of intellectual property assets, comprising 107 key issued patents worldwide, and over 300 pending patent applications, along with extensive enabling technologies and platforms.

We are comprised of three operating segments, of which the Therapeutics and Life Sciences segments have evolved out of our core competencies: the use of nucleic acids as informational molecules and the use of compounds for immune modulation and augmented by the acquisition of a number of related companies. Information concerning sales by geographic area and business segments for the years ended July 31, 2011, 2010 and 2009 is located in Note 17 to the notes to our consolidated financial statements incorporated by reference into this prospectus supplement.

Below are brief descriptions of each of our operating segments:

Enzo Life Sciences manufactures, develops and markets functional biology and cellular biochemistry products and tools to life sciences, pharmaceutical and clinical research customers world-wide and has amassed a large patent and technology portfolio. Enzo Life Sciences, Inc. is a recognized leader in labeling and detection technologies across research and diagnostic markets. Our strong portfolio of proteins, antibodies, peptides, small molecules, labeling probes, dyes and kits provides life science researchers tools for target identification/validation, high content analysis, gene expression analysis, nucleic acid detection, protein biochemistry and detection, and cellular analysis. We are internationally recognized and acknowledged as a leader in manufacturing, in-licensing, and commercialization of over 9,000 of our own products and in addition distribute over 30,000 products made by over 40 other original manufacturers. Our strategic focus is directed to innovative high quality research reagents and kits in the primary key research areas of protein homeostasis, epigenetics, live cell analysis, molecular biology and immunoassays.

The segment is an established source for a comprehensive panel of products to scientific experts in the fields of Natural Products/Antibiotics, Autophagy, Cancer, Cell Cycle, Cell Death, Cell Signaling, Cellular Analysis, Endocrinology/Hormones, DNA regulation, Compound Screening, Genomics/Molecular Biology, GPCRs, Immunology, Inflammation, Metabolism, Neuroscience, Nitric Oxide pathway, Obesity/Adipokines, Oxidative Stress, Proteases, Proteasomes, Protein Expression and modification, Signal Transduction, Stress/Heat Shock proteins and Ubiquitin/Ubl signaling.

Enzo Clinical Labs is a regional clinical laboratory serving the New York, New Jersey and Eastern Pennsylvania medical communities. The Company believes having clinical diagnostic services allows us to capitalize first hand on our extensive advanced molecular and cytogenetic capabilities and the broader trends in predictive and personalized diagnostics. Enzo Clinical Labs offers 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, and search for an otherwise undiagnosed condition. We operate a full-service clinical laboratory in Farmingdale, New York, a network of approximately 30 patient service centers throughout New York and New Jersey, a stand alone “stat” or rapid response laboratory in New York City and a full-service phlebotomy and logistics department.

Enzo Therapeutics is a biopharmaceutical venture 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. Enzo Therapeutics has focused its efforts on developing treatment regimens for diseases and conditions for 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 45 patents and patent applications.

Our primary sources of revenue have historically been from product revenues and royalty and licensing 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

The following is a brief summary of some of the terms of the offering and is qualified in its entirety by reference to the more detailed information appearing elsewhere in this prospectus supplement and the accompanying prospectus. For a more complete description of the terms of our common stock, see the "Description of the Securities We Are Offering" section in this prospectus supplement.

Common Stock We Are Offering	275,000 shares
Common Stock Outstanding Immediately Before This Offering	38,927,700 shares
Use of proceeds	We will not receive any proceeds from the offering of the shares of common stock as all of the consideration received by us was in the form of satisfaction of outstanding amounts we owed to the investor. For more information, see "Use of Proceeds" on page S-7.
Risk Factors	See "Risk Factors" and other information included in this prospectus supplement, or incorporated herein by reference, for a discussion of factors you should carefully consider before deciding to invest in the common stock.
New York Stock Exchange Symbol	ENZ

Unless otherwise noted in this prospectus supplement, all information in this prospectus supplement assumes no exercise of any of the options to purchase 775,575 shares of our common stock at a weighted average exercise price per share of \$14.49, as of April 30, 2012.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before purchasing our common stock, you should carefully consider the following risk factors as well as all other information contained in this prospectus supplement and the accompanying prospectus and the documents incorporated by reference, including our consolidated financial statements and the related notes. Each of these risk factors, either alone or taken together, could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our common stock. There may be additional risks that we do not presently know of or that we currently believe are immaterial which could also impair our business and financial position. If any of the events described below were to occur, our financial condition, our ability to access capital resources, our results of operations and/or our future growth prospects could be materially and adversely affected and the market price of our common stock could decline. As a result you could lose some or all of any investment you may have made or may make in our common stock.

Risks Related to this Offering and our 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.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus, the documents we have filed with the SEC that are incorporated herein by reference contain 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. These statements are based on our current expectations, assumptions, estimates and projections about our business and our industry, and involve known and unknown risks, uncertainties and other factors that may cause our results, levels of activity, performance or achievement to be materially different from any future results, levels of activity, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” and similar expressions intended to identify forward-looking statements. While we believe that we have a reasonable basis for each forward-looking statement, we caution you that these statements are based on a combination of facts and factors currently known by us and our projections of the future, about which we cannot be certain. We discuss many of these risks, uncertainties and other factors in greater detail under the heading “Risk Factors” contained in this prospectus supplement. Given these risks, uncertainties and other factors, you should not place undue reliance on these forward-looking statements. Also, these forward-looking statements represent our estimates and assumptions only as of the date such forward-looking statements are made. You should read carefully both this prospectus supplement and the accompanying prospectus, together with the information incorporated herein by reference as described under the heading “Where You Can Find More Information” in this prospectus supplement and the accompanying prospectus, completely and with the understanding that our actual future results may be materially different from what we expect. We hereby qualify all of our forward-looking statements by these cautionary statements.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future.

USE OF PROCEEDS

We will not receive any proceeds from the offering of the shares of common stock as all of the consideration received by us was in the form of satisfaction of outstanding amounts we owed to the investor.

DESCRIPTION OF SECURITIES WE ARE OFFERING

In this offering, we are offering 275,000 shares of common stock. The material terms and provisions of our common stock and each other class of our securities which qualifies or limits our common stock are described under the caption "Description of Capital Stock" starting on page 4 of the accompanying prospectus.

PLAN OF DISTRIBUTION

Pursuant to this prospectus supplement, we are offering 275,000 shares of our common stock that were issued by us directly to our legal counsel, Greenberg Traurig, LLP, in satisfaction of \$500,000 of outstanding legal fees owed by us to Greenberg Traurig, LLP. Based on the closing price of our common stock of \$1.73 on the New York Stock Exchange on June 26, 2012, which was the last trading day prior to the day of the offering, the shares issued had an aggregate value of \$475,750.

We estimate that our out-of-pocket expenses for this offering will be approximately \$20,000.

The closing of this offering took place on June 27, 2012.

LEGAL MATTERS

The validity of the securities offered by this prospectus supplement will be passed upon for us by Greenberg Traurig, LLP, New York, New York. Shareholders of Greenberg Traurig, LLP beneficially own in the aggregate 23,262 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, 2011 (including the schedule appearing therein) and the effectiveness of Enzo Biochem, Inc.'s internal control over financial reporting as of July 31, 2011 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 consolidated financial statements are 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 supplement and should not be relied upon with respect thereto.

INCORPORATION 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, 2011 filed on October 14, 2011;
- Our Proxy Statement on Schedule 14A filed on November 28, 2011;
- Our Quarterly Report on Form 10-Q for the quarter ended April 30, 2012, filed on June 11, 2012, our Quarterly Report on Form 10-Q for the quarter ended January 31, 2012, filed on March 12, 2012 and our Quarterly Report on Form 10-Q for the quarter ended October 31, 2011, filed on December 12, 2011;
- Our Current Reports on Form 8-K filed on February 1, 2012, March 14, 2012 and June 15, 2012;
- The description of our common stock contained in our registration statement on Form 8-A filed with the SEC on December 8, 1999, including any amendment or reports filed for the purpose of updating such description; and
- All documents we subsequently file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 on or after the date of this prospectus and before the termination of the offering of the securities described in this prospectus, other than documents or information deemed furnished and not filed in accordance with SEC rules.

This prospectus supplement is part of a registration statement on Form S-3 we have filed with the SEC under the Securities Act. This prospectus supplement 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 supplement 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

PROSPECTUS



\$50,000,000

**Common Stock
Preferred Stock
Debt Securities
Warrants
Units**

We may from time to time offer and sell common stock, preferred stock, debt securities, warrants, and units, having an aggregate offering price of up to \$50,000,000. We may offer and sell these securities separately or together in any combination. We may offer and sell these securities to or through underwriters, directly to investors or through agents. We will specify the terms of the securities, and the names of any underwriters or agents and their respective compensation, in supplements to this prospectus. Our common stock is listed on the New York Stock Exchange under the symbol "ENZ." On June 30, 2010, the last reported sale price of our common stock on the New York Stock Exchange was \$4.07 per share.

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 August 5, 2010.

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A BOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, using a “shelf” registration process. Under this shelf process, we may sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of \$50,000,000. We have provided to you in this prospectus a general description of the securities we may offer. Each time we sell securities under this shelf registration process, we will provide a prospectus supplement that will contain specific information about the terms of the offering. We may also add, update or change in the prospectus supplement or any “free writing prospectus” we may authorize to be delivered to you any of the information contained in this prospectus. To the extent there is a conflict between the information contained in this prospectus and the prospectus supplement or any free writing prospectus we may authorize to be delivered to you, you should rely on the information in the prospectus supplement or free writing prospectus, as the case may be, provided that if any statement in one of these documents is inconsistent with a statement in another document having a later date—for example, a document incorporated by reference in this prospectus or any prospectus supplement—the statement in the document having the later date modifies or supersedes the earlier statement. This prospectus, together with the applicable prospectus supplements and any free writing prospectus we may authorize to be delivered to you, includes all material information relating to this offering.

An investment in our securities involves certain risks that should be carefully considered by prospective investors. See “Risk Factors.”

We incorporate by reference important business and financial information about us into this prospectus. You may obtain the information incorporated by reference into this prospectus without charge by following the instructions under “Where You Can Find More Information.” You should carefully read this prospectus and any prospectus supplement as well as additional information described under “Incorporation of Certain Documents by Reference.” All references in this prospectus to “Enzo Biochem,” “Enzo,” the “Company,” “we,” “us” or “our” mean Enzo Biochem, Inc., unless we state otherwise or the context otherwise requires.

You should rely only on the information contained in, or incorporated by reference into, this prospectus. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We are not making an offer to sell these securities in any jurisdiction where the offer is not permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or the time of issuance or resale of any securities. Our business, financial condition, results of operations and prospects may have changed since those 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 any of our securities.

Enzo Biochem, Inc.

Our Business Strategy and Objective

We are a life sciences and biotechnology company focused on harnessing biological processes to develop research tools, diagnostics and therapeutics and on serving as a provider of diagnostic services to the medical community. Since our founding in 1976, our strategic focus has been on the development of enabling technologies in the life sciences field. Our pioneering work in genomic analysis coupled with its 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.

In the course of our research and development activities, we have built a substantial portfolio of intellectual property assets, with 249 issued patents worldwide, and over 200 pending patent applications, along with extensive enabling technologies and platforms.

We are comprised of three operating segments, of which the Therapeutics and Life Sciences segments have evolved out of our core competencies: the use of nucleic acids as informational molecules and the use of compounds for immune modulation. Below are brief descriptions of each of our operating segments:

Enzo Life Sciences manufactures, develops and markets functional biology and cellular biochemistry products and tools to research and pharmaceutical customers worldwide 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. We are internationally recognized and acknowledged as a leader in manufacturing, in-licensing, and commercialization of over 12,000 innovative high quality research reagents in the primary key research areas of epigenetics, live cell analysis, protein degradation pathways and metabolism. The division is an established source for a comprehensive panel of products to scientific experts in the fields of Antibiotics, Autophagy, Cancer, Cell Cycle, Cell Death, Cell Signaling, Cell trafficking, Genomics/Molecular Biology, Immunology, Inflammation, Lipid Signaling, Neurobiology, Protein Degradation, ROS/RNS, and Stress/Heat Shock.

Enzo Clinical Labs is a regional clinical laboratory serving the New York Metropolitan and New Jersey areas. The Company believes having clinical diagnostic services allows us to capitalize first hand on our extensive advanced molecular and cytogenetic capabilities and the broader trends in predictive and personalized diagnostics. Enzo Clinical Labs offers 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, and search for an otherwise undiagnosed condition. We operate a full-service clinical laboratory in Farmingdale, New York, a network of 30 patient service centers throughout New York and New Jersey, a stand alone “stat” or rapid response laboratory in New York City, and a full-service phlebotomy department.

Enzo Therapeutics is a biopharmaceutical venture 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. Enzo Therapeutics has focused its efforts on developing treatment regimens for diseases and conditions for 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.

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.

Corporate Information

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

RISK FACTORS

Investing in our securities involves risk. We have included more detailed descriptions of these risks and uncertainties and other risks and uncertainties applicable to our business in “Risk Factors” included under Item 1A. to our Annual Report on Form 10-K for the year ended July 31, 2009, which is incorporated by reference into this prospectus. Before making an investment decision, you should carefully consider these risks as well as other information we include or incorporate by reference in this prospectus and any prospectus supplement. The risks and uncertainties we have described are not the only ones facing us. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business operations.

FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into this prospectus, contain forward-looking statements. Statements made in, or incorporated by reference into, this prospectus other than statements of historical fact, including statements about us and the future of our respective clinical trials, research programs, product pipelines, current and potential corporate partnerships, licenses and intellectual property, the adequacy of capital reserves and anticipated operating results and cash expenditures, are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). When used in, or incorporated by reference into, this prospectus the words “anticipate,” “objective,” “may,” “might,” “should,” “could,” “can,” “intend,” “expect,” “believe,” “estimate,” “predict,” “potential,” “plan” or the negative of these and similar expressions identify forward-looking statements. These statements reflect our current views with respect to uncertain future events and are based on imprecise estimates and assumptions and subject to risk and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. While we believe our plans, intentions and expectations reflected in those forward-looking statements are reasonable, these plans, intentions or expectations may not be achieved. Our actual results, performance or achievements could differ materially from those contemplated, expressed or implied by the forward-looking statements contained in, or incorporated by reference into, this prospectus for a variety of reasons.

All forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by the risk factors and other cautionary statements set forth in this prospectus. Other than as required by applicable securities laws, we are under no obligation, and we do not intend, to update any forward-looking statement, whether as result of new information, future events or otherwise.

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](http://www.sec.gov) as described under the heading “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 securities offered by this prospectus for general corporate purposes, including without limitation, the funding of future acquisitions, the funding of our clinical research and development programs, the clinical development of our product capabilities, capital expenditures and working capital needs. We will set forth in the prospectus supplement our intended use for the net proceeds received from the sale of any securities.

THE SECURITIES WE MAY OFFER

The descriptions of the securities contained in this prospectus, together with the applicable prospectus supplements, summarize all the material terms and provisions of the various types of securities that we may offer. We will describe in the applicable prospectus supplement relating to any securities the particular terms of the securities offered by that prospectus supplement. If we indicate in the applicable prospectus supplement, the terms of the securities may differ from the terms we have summarized below. We will also include in the prospectus supplement information, where applicable, about material United States federal income tax considerations relating to the securities, and the securities exchange, if any, on which the securities will be listed.

We may sell from time to time, in one or more offerings:

- common stock;
- preferred stock;
- debt securities;
- warrants to purchase any of the securities listed above; and
- units consisting of any combination of the securities listed above.

In this prospectus, we refer to the common stock, preferred stock, debt securities, warrants and units collectively as “securities.” The total dollar amount of all securities that we may sell will not exceed \$50,000,000.

If we issue debt securities at a discount from their original stated principal amount, then, for purposes of calculating the total dollar amount of all securities issued under this prospectus, we will treat the initial offering price of the debt securities as the total original principal amount of the debt securities.

This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.

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 June 25, 2010, we had outstanding 38,157,877 shares of common stock and no shares of preferred stock. As of June 25, 2010, we had approximately 1,010 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.

D DESCRIPTION OF DEBT SECURITIES

The following description, together with the additional information we include in any applicable prospectus supplement, summarizes the material terms and provisions of the debt securities that we may offer under this prospectus and the related indenture. While the terms we have summarized below will apply generally to any future debt securities we may offer pursuant to this prospectus, we will describe the particular terms of any debt securities that we may offer in more detail in the applicable prospectus supplement. If we indicate in a prospectus supplement, the terms of any debt securities we offer under that prospectus supplement may differ from the terms we describe below.

We may offer debt securities from time to time in one or more offerings under this prospectus. We will issue any such debt securities under an indenture that we will enter into with a trustee to be named in the indenture. We have filed a form of indenture as an exhibit to the registration statement of which this prospectus is a part. The indenture will be qualified under the Trust Indenture Act of 1939, as in effect on the date of the indenture. We use the term “debenture trustee” to refer to the trustee under the indenture.

The following summaries of material provisions of the debt securities and the indenture are subject to, and qualified in their entirety by reference to, all the provisions of the indenture applicable to a particular series of debt securities.

General

The indenture provides that debt securities may be issued from time to time in one or more series. The indenture does not limit the amount of debt securities that may be issued thereunder, and the indenture provides that the specific terms of any series of debt securities shall be set forth in, or determined pursuant to, an authorizing resolution, an officers’ certificate and/or a supplemental indenture, if any, relating to such series.

We will describe in each prospectus supplement the following terms relating to a series of debt securities:

- the title or designation of the debt securities;
- whether the debt securities will be secured or unsecured, and the terms of any secured debt;
- the terms of the subordination of any series of subordinated debt securities;
- any limit upon the aggregate principal amount of the debt securities;
- the date or dates on which the debt securities may be issued and on which we will pay the principal on the debt securities;
- the interest rate, which may be fixed or variable, or the method for determining the rate and the date interest will begin to accrue, the date or dates interest will be payable and the record dates for interest payment dates or the method for determining such dates;
- the manner in which the amounts of payment of principal of, premium or interest on the debt securities will be determined, if these amounts may be determined by reference to an index based on a currency or currencies other than that in which the debt securities are denominated or designated to be payable or by reference to a commodity, commodity index, stock exchange index or financial index;
- the currency of denomination of the debt securities;
- if payments of principal of, premium or interest on the debt securities will be made in one or more currencies or currency units other than that or those in which the debt securities are denominated, the manner in which the exchange rate with respect to these payments will be determined;

- the place or places where the principal of, premium, and interest on the debt securities will be payable, where debt securities of any series may be presented for registration of transfer, exchange or conversion, and where notices and demands to or upon the Company in respect of the debt securities may be made;
- the form of consideration in which principal of, premium or interest on the debt securities will be paid;
- the terms and conditions upon which we may redeem the debt securities;
- any obligation we have to redeem or purchase the debt securities pursuant to any sinking fund, amortization or analogous provisions or at the option of a holder of debt securities;
- the dates on which and the price or prices at which we will repurchase the debt securities at the option of the holders of debt securities and other detailed terms and provisions of these repurchase obligations;
- the denominations in which the debt securities will be issued, if other than denominations of \$1,000 and any integral multiple thereof;
- the portion of principal amount of the debt securities payable upon declaration of acceleration of the maturity date, if other than the principal amount;
- whether the debt securities are to be issued at any original issuance discount and the amount of discount with which such debt securities may be issued;
- whether the debt securities will be issued in the form of certificated debt securities or global debt securities and, in such case, the depositary for such global security or securities and the terms and conditions, if any, upon which interests in such global security or securities may be exchanged in whole or in part for the individual securities represented thereby;
- provisions, if any, for the defeasance of the debt securities of a series in whole or in part and any addition or change in the provisions related to satisfaction and discharge;
- the form of the debt securities;
- the terms and conditions upon which the debt securities will be so convertible or exchangeable into securities or property of another person, if at all, and any additions or changes, if any, to permit or facilitate such conversion or exchange;
- whether the debt securities will be subject to subordination and the terms of such subordination;
- provisions, if any, granting special rights to holders of the debt securities upon the occurrence of specified events;
- any restriction or condition on the transferability of the debt securities;
- any addition or change in the provisions related to compensation and reimbursement of the trustee which applies to securities of such series;
- any addition to or change in the events of default described in this prospectus or in the indenture with respect to the debt securities and any change in the acceleration provisions described in this prospectus or in the indenture with respect to the debt securities;

- any addition to or change in the covenants described in this prospectus or in the indenture with respect to the debt securities; and
- any other terms of the debt securities, which may modify or delete any provision of the indenture.

We may issue debt securities that provide for an amount less than their stated principal amount to be due and payable upon declaration of acceleration of their maturity pursuant to the terms of the indenture. We will provide you with information on the federal income tax considerations and other special considerations applicable to any of these debt securities in the applicable prospectus supplement.

Conversion or Exchange Rights

We will set forth in the prospectus supplement the terms, if any, on which a series of debt securities may be convertible into or exchangeable for our common stock or our other securities. We will include provisions as to whether conversion or exchange is mandatory, at the option of the holder or at our option. We may include provisions pursuant to which the number of shares of our common stock or our other securities that the holders of the series of debt securities receive would be subject to adjustment.

Consolidation, Merger or Sale; No Protection in Event of a Change of Control or Highly Leveraged Transaction

The indenture provides that we may not merge or consolidate with or into another entity, or sell other than for cash or lease all or substantially all our assets to another entity, or purchase all or substantially all the assets of another entity unless we are the surviving entity or, if we are not the surviving entity, the successor, transferee or lessee entity expressly assumes all of our obligations under the indenture or the debt securities, as appropriate.

Unless we state otherwise in the applicable prospectus supplement, the debt securities will not contain any provisions that may afford holders of the debt securities additional protection in the event we have a change of control or in the event of a highly leveraged transaction (whether or not such transaction results in a change of control), which could adversely affect holders of debt securities.

Events of Default Under the Indenture

The following are events of default under the indenture with respect to any series of debt securities that we may issue:

- if we fail to pay interest when due and our failure continues for 90 days and the time for payment has not been extended or deferred;
- if we fail to pay the principal, or premium, if any for 30 days, when due whether by maturity or called for redemption;
- if we fail to pay a sinking fund installment, if any, when due and our failure continues for 30 days;
- if we fail to observe or perform any other covenant relating to such series contained in the debt securities of such series or the indenture, other than a covenant specifically relating to and for the benefit of holders of another series of debt securities, and our failure continues for 90 days after we receive written notice from the debenture trustee or holders of not less than a majority in aggregate principal amount of the outstanding debt securities of the applicable series; and
- if specified events of bankruptcy, insolvency or reorganization occur as to us.

No event of default with respect to a particular series of debt securities (except as to certain events of bankruptcy, insolvency or reorganization) necessarily constitutes an event of default with respect to any other series of debt securities. The occurrence of an event of default may constitute an event of default under any bank credit agreements we may have in existence from time to time. In addition, the occurrence of certain events of default or an acceleration under the indenture may constitute an event of default under certain of our other indebtedness outstanding from time to time.

If an event of default with respect to debt securities of any series at the time outstanding occurs and is continuing, then the trustee or the holders of not less than a majority in principal amount of the outstanding debt securities of that series may, by a notice in writing to us (and to the debenture trustee if given by the holders), declare to be due and payable immediately the principal (or, if the debt securities of that series are discount securities, that portion of the principal amount as may be specified in the terms of that series) of and premium and accrued and unpaid interest, if any, on all debt securities of that series. Before a judgment or decree for payment of the money due has been obtained with respect to debt securities of any series, the holders of a majority in principal amount of the outstanding debt securities of that series (or, at a meeting of holders of such series at which a quorum is present, the holders of a majority in principal amount of the debt securities of such series represented at such meeting) the acceleration shall be deemed to have been waived, rescinded and annulled if all events of default, other than the non-payment of accelerated principal, premium, if any, and interest, if any, with respect to debt securities of that series, have been cured or waived as provided in the applicable indenture (including payments or deposits in respect of principal, premium or interest that had become due other than as a result of such acceleration) and the Company has deposited with the indenture trustee or paying agent a sum sufficient to pay all amounts owed to the indenture trustee under the indenture, all arrears of interest, if any, on the debt securities, and the principal and premium, if any, on the debt securities that have become due other than by such acceleration. We refer you to the prospectus supplement relating to any series of debt securities that are discount securities for the particular provisions relating to acceleration of a portion of the principal amount of such discount securities upon the occurrence of an event of default.

Subject to the terms of the indenture, if an event of default under the indenture shall occur and be continuing, the debenture trustee will be under no obligation to exercise any of its rights or powers under such indenture at the request or direction of any of the holders of the applicable series of debt securities, unless such holders have offered the debenture trustee reasonable indemnity. The holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the debenture trustee, or exercising any trust or power conferred on the debenture trustee, with respect to the debt securities of that series, provided that, subject to the terms of the indenture, the debenture trustee need not take any action that it believes, upon the advice of counsel, might involve it in personal liability or might be unduly prejudicial to the holders not involved in the proceeding.

A holder of the debt securities of any series will only have the right to institute a proceeding under the indenture or to appoint a receiver or trustee, or to seek other remedies if:

- the holder previously has given written notice to the debenture trustee of a continuing event of default with respect to that series;
- the holders of at least a majority in aggregate principal amount of the outstanding debt securities of that series have made written request, and such holders have offered reasonable indemnity to the debenture trustee to institute the proceeding as trustee; and
- the debenture trustee does not institute the proceeding, and does not receive from the holders of a majority in aggregate principal amount of the outstanding debt securities of that series (or at a meeting of holders of such series at which a quorum is present, the holders of a majority in principal amount of the debt securities of such series represented at such meeting) other conflicting directions within 60 days after the notice, request and offer.

These limitations do not apply to a suit instituted by a holder of debt securities if we default in the payment of the principal, premium, if any, or interest on, the debt securities.

We will periodically file statements with the applicable debenture trustee regarding our compliance with specified covenants in the applicable indenture.

Modification of Indenture; Waiver

The debenture trustee and we may, without the consent of any holders, execute a supplemental indenture to change the applicable indenture with respect to specific matters, including, among other things:

to surrender any right or power conferred upon the Company;

- to provide, change or eliminate any restrictions on the payment of principal of or premium, if any, on the debt securities; provided that any such action shall not adversely affect the interests of the holders of debt securities of any series in any material respect;
- to change or eliminate any of the provisions of the indenture; provided that any such change or elimination shall become effective only when there is no outstanding debt security of any series created prior to the execution of such supplemental indenture that is entitled to the benefit of such provision and as to which such supplemental indenture would apply;
- to evidence the succession of another corporation to the Company;
- to evidence and provide for the acceptance of appointment by a successor trustee with respect to one or more series of debt securities and to add or change provisions of the indenture to facilitate the administration of the trusts thereunder by more than one trustee;
- to cure any ambiguity, mistake, manifest error, omission, defect or inconsistency in the indenture or to conform the text of any provision in the indenture or in any supplemental indenture to any description thereof in the applicable section of a prospectus, prospectus supplement or other offering document that was intended to be a verbatim recitation of a provision of the indenture or of any supplemental indenture;
- to add to or change or eliminate any provision of the indenture as shall be necessary or desirable in accordance with any amendments to the Trust Indenture Act;
- to make any change in any series of debt securities that does not adversely affect in any material respect the interests of the holders of such debt securities; and
- to supplement any of the provisions of the indenture to such extent as shall be necessary to permit or facilitate the defeasance and discharge of any series of debt securities; provided that any such action shall not adversely affect the interests of the holders of debt securities of such series or any other series of debt securities.

In addition, under the indenture, the rights of holders of a series of debt securities may be changed by us and the debenture trustee with the written consent of the holders of at least a majority in aggregate principal amount of the outstanding debt securities of each series (or, at a meeting of holders of such series at which a quorum is present, the holders of a majority in principal amount of the debt securities of such series represented at such meeting) that is affected. However, the debenture trustee and we may make the following changes only with the consent of each holder of any outstanding debt securities affected:

extending the fixed maturity of the series of debt securities;

- reducing the principal amount, reducing the rate of or extending the time of payment of interest, or any premium payable upon the redemption of any debt securities;
- reducing the principal amount of discount securities payable upon acceleration of maturity;
- making the principal of or premium or interest on any debt security payable in currency other than that stated in the debt security;

- impairing the right to institute suit for the enforcement of any payment on or after the fixed maturity date of any series of debt securities;
- materially adversely affecting the economic terms of any right to convert or exchange any debt securities; and
- reducing the percentage of debt securities, the holders of which are required to consent to any amendment or waiver; or modifying, without the written consent of the trustee, the rights, duties or immunities of the trustee.

Except for certain specified provisions, the holders of at least a majority in principal amount of the outstanding debt securities of any series (or, at a meeting of holders of such series at which a quorum is present, the holders of a majority in principal amount of the debt securities of such series represented at such meeting) may, on behalf of the holders of all debt securities of that series, waive our compliance with provisions of the indenture. The holders of a majority in principal amount of the outstanding debt securities of any series may, on behalf of the holders of all the debt securities of such series, waive any past default under the indenture with respect to that series and its consequences, other than a default in the payment of the principal of, premium or any interest on any debt security of that series; provided, however, that the holders of a majority in principal amount of the outstanding debt securities of any series may rescind an acceleration and its consequences, including any related payment default that resulted from the acceleration.

Discharge

The indenture provides that we can elect to be discharged from our obligations with respect to one or more series of debt securities. In order to exercise our rights to be discharged with respect to a series, we must deposit with the trustee money or government obligations sufficient to pay all the principal of, the premium, if any, and interest on, the debt securities of the series on the dates payments are due.

Form, Exchange and Transfer

We will issue the debt securities of each series only in fully registered form without coupons and, unless we otherwise specify in the applicable prospectus supplement, in denominations of \$1,000 and any integral multiple thereof. The indenture provides that we may issue debt securities of a series in temporary or permanent global form and as book-entry securities that will be deposited with a depository named by us and identified in a prospectus supplement with respect to that series.

At the option of the holder, subject to the terms of the indenture and the limitations applicable to global securities described in the applicable prospectus supplement, the holder of the debt securities of any series can exchange the debt securities for other debt securities of the same series, in any authorized denomination and of like tenor and aggregate principal amount.

Subject to the terms of the indenture and the limitations applicable to global securities set forth in the applicable prospectus supplement, holders of the debt securities may present the debt securities for exchange or for registration of transfer, duly endorsed or with the form of transfer endorsed thereon duly executed if so required by us or the security registrar, at the office of the security registrar or at the office of any transfer agent designated by us for this purpose. Unless otherwise provided in the debt securities that the holder presents for transfer or exchange or in the indenture, we will make no service charge for any registration of transfer or exchange, but we may require payment of any taxes or other governmental charges.

We will name in the applicable prospectus supplement the security registrar, and any transfer agent in addition to the security registrar, that we initially designate for any debt securities. We may at any time designate additional transfer agents or rescind the designation of any transfer agent or approve a change in the office through which any transfer agent acts, except that we will be required to maintain a transfer agent in each place of payment for the debt securities of each series.

If we elect to redeem the debt securities of any series, we will not be required to:

- issue, register the transfer of, or exchange any debt securities of that series during a period beginning at the opening of business 15 days before the day of mailing of a notice of redemption of any debt securities that may be selected for redemption and ending at the close of business on the day of the mailing; or
- register the transfer of or exchange any debt securities so selected for redemption, in whole or in part, except the unredeemed portion of any debt securities we are redeeming in part.

Information Concerning the Debenture Trustee

The debenture trustee, other than during the occurrence and continuance of an event of default under the indenture, undertakes to perform only those duties as are specifically set forth in the indenture. Upon an event of default under the indenture, the debenture trustee must use the same degree of care as a prudent person would exercise or use in the conduct of his or her own affairs. Subject to this provision, the debenture trustee is under no obligation to exercise any of the powers given it by the indenture at the request of any holder of debt securities unless it is offered reasonable security and indemnity against the costs, expenses and liabilities that it might incur.

Payment and Paying Agents

Unless we otherwise indicate in the applicable prospectus supplement, we will make payment of the interest on any debt securities on any interest payment date to the person in whose name the debt securities, or one or more predecessor securities, are registered at the close of business on the regular record date for the interest.

Unless we otherwise indicate in the applicable prospectus supplement, we will pay principal of and any premium and interest on the debt securities of a particular series at the office of the indenture trustee or, at the option of the Company, by wire or check payable to the holder. Unless we otherwise indicate in a prospectus supplement, we will designate the corporate trust office of the debenture trustee our sole paying agent for payments with respect to debt securities of each series. We will name in the applicable prospectus supplement any other paying agents that we initially designate for the debt securities of a particular series. We will maintain a paying agent in each place of payment for the debt securities of a particular series. All money we pay to a paying agent or the debenture trustee for the payment of the principal of or any premium or interest on any debt securities which remains unclaimed at the end of two years after such principal, premium or interest has become due and payable will be repaid to us, and the holder of the security thereafter may look only to us for payment thereof.

Governing Law

The indenture and the debt securities will be governed and construed in accordance with the laws of the State of New York.

D DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplements, summarizes the material terms and provisions of the warrants that we may offer under this prospectus and the related warrant agreements and warrant certificates. While the terms summarized below will apply generally to any warrants that we may offer, we will describe the particular terms of any series of warrants in more detail in the applicable prospectus supplement. If we indicate in the prospectus supplement, the terms of any warrants offered under that prospectus supplement may differ from the terms described below. Specific warrant agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement that includes this prospectus.

General

We may issue warrants for the purchase of common stock, preferred stock or debt securities in one or more series. We may issue warrants independently or together with common stock, preferred stock and debt securities, and the warrants may be attached to or separate from these securities.

We will evidence each series of warrants by warrant certificates that we will issue under a separate agreement. We may enter into a warrant agreement with a warrant agent. If we engage a warrant agent, each warrant agent will be a bank that we select which has its principal office in the United States. We will indicate the name and address of the warrant agent in the applicable prospectus supplement relating to a particular series of warrants.

Before exercising their warrants, holders of warrants will not have any of the rights of holders of the securities purchasable upon such exercise, including:

- in the case of warrants to purchase debt securities, the right to receive payments of principal of, or premium, if any, or interest on, the debt securities purchasable upon exercise or to enforce covenants in the applicable indenture; or
- in the case of warrants to purchase common stock or preferred stock, the right to receive dividends, if any, or, payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any.

Additional Information

We will describe in the applicable prospectus supplement the terms of the series of warrants, including:

- the offering price and aggregate number of warrants offered;
- the currency for which the warrants may be purchased;
- if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;
- if applicable, the date on and after which the warrants and the related securities will be separately transferable;
- in the case of warrants to purchase debt securities, the principal amount of debt securities purchasable upon exercise of one warrant and the price at, and currency in which, this principal amount of debt securities may be purchased upon such exercise;
- in the case of warrants to purchase common stock or preferred stock, the number of shares of common stock or preferred stock, as the case may be, purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;
- the terms of any rights to redeem or call the warrants;
- any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreement and warrants may be modified;
- a discussion on any material or special United States federal income tax consequences of holding or exercising the warrants;
- the terms of the securities issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Exercise of Warrants

Each warrant will entitle the holder to purchase the securities that we specify in the applicable prospectus supplement at the exercise price that we describe in the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to 5 p.m., Eastern time, on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Holders of the warrants may exercise the warrants by delivering the warrant certificate representing the warrants to be exercised together with specified information, and paying the required amount to the warrant agent in immediately available funds, as provided in the applicable prospectus supplement. We will set forth on the reverse side of the warrant certificate and in the applicable prospectus supplement the information that the holder of the warrant will be required to deliver to the warrant agent.

Upon receipt of the required payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement, we will issue and deliver the securities purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate are exercised, then we will issue a new warrant certificate for the remaining amount of warrants. If we so indicate in the applicable prospectus supplement, holders of the warrants may surrender securities as all or part of the exercise price for warrants.

Enforceability of Rights by Holders of Warrants

Each warrant agent will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the securities purchasable upon exercise of, its warrants.

DESCRIPTION OF UNITS

We may issue units comprised of one or more of the other securities described in this prospectus in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date. The applicable prospectus supplement may describe:

- the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units;
- the terms of the unit agreement governing the units;
- United States federal income tax considerations relevant to the units; and
- whether the units will be issued in fully registered global form.

This summary of certain general terms of units and any summary description of units in the applicable prospectus supplement do not purport to be complete and are qualified in their entirety by reference to all provisions of the applicable unit agreement and, if applicable, collateral arrangements and depositary arrangements relating to such units. The forms of the unit agreements and other documents relating to a particular issue of units will be filed with the SEC each time we issue units, and you should read those documents for provisions that may be important to you.

PLAN OF DISTRIBUTION

We may sell the securities through underwriters or dealers, through agents, or directly to one or more purchasers. The accompanying prospectus supplement will describe the terms of the offering of the securities, including:

- the name or names of any underwriters;
- the purchase price of the securities being offered and the proceeds we will receive from the sale;
- any over-allotment options pursuant to which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents' or underwriters' compensation;
- any public offering price;
- any discounts or concessions allowed or reallocated or paid to dealers; and
- any securities exchange or market on which the securities may be listed.

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities from time to time in one or more transactions at a fixed public offering price or at varying prices determined at the time of the sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all the securities offered by the prospectus supplement. We may change from time to time the public offering price and any discounts or concessions allowed or reallocated or paid to dealers. We may use underwriters with whom we have a material relationship. We will describe such relationships in the prospectus supplement naming the underwriter and the nature of any such relationship.

We may engage in "at the market" offerings of our common stock, which are offerings into an existing trading market, at other than a fixed price, on or through the facilities of a national securities exchange or to or through a market maker otherwise than on an exchange.

We may sell securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of the securities, and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best efforts basis for the period of its appointment.

We may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including short sale transactions. If so, the third party may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of common shares, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of common shares. The third party in such sale transactions will be an underwriter and, if not identified in this prospectus, will be identified in the applicable prospectus supplement or a post-effective amendment to this registration statement.

All securities we offer other than common stock will be new issues of securities with no established trading market. Any underwriters may make a market in these securities, but will not be obligated to do so and may discontinue any market making at any time without notice. We cannot guarantee the liquidity of the trading markets for any securities.

We may provide agents and underwriters with indemnification against civil liabilities related to this offering, including liabilities under the Securities Act, or contribution with respect to payments that the agents or underwriters may make with respect to these liabilities. Agents and underwriters may engage in transactions with, or perform services for, us in the ordinary course of business.

Rules of the Securities and Exchange Commission may limit the ability of any underwriters to bid for or purchase securities before the distribution of the securities is completed. However, underwriters may engage in the following activities in accordance with the rules:

- Stabilizing transactions — Underwriters may make bids or purchases for the purpose of pegging, fixing or maintaining the price of the shares, so long as stabilizing bids do not exceed a specified maximum.
- Over-allotments and syndicate covering transactions — Underwriters may sell more shares of our common stock than the number of shares that they have committed to purchase in any underwritten offering. This over-allotment creates a short position for the underwriters. This short position may involve either “covered” short sales or “naked” short sales. Covered short sales are short sales made in an amount not greater than the underwriters’ over-allotment option to purchase additional shares in any underwritten offering. The underwriters may close out any covered short position either by exercising their over-allotment option or by purchasing shares in the open market. To determine how they will close the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market, as compared to the price at which they may purchase shares through the over-allotment option. Naked short sales are short sales in excess of the over-allotment option. The underwriters must close out any naked position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that, in the open market after pricing, there may be downward pressure on the price of the shares that could adversely affect investors who purchase shares in the offering.
- Penalty bids — If underwriters purchase shares in the open market in a stabilizing transaction or syndicate covering transaction, they may reclaim a selling concession from other underwriters and selling group members who sold those shares as part of the offering.

Similar to other purchase transactions, an underwriter’s purchases to cover the syndicate short sales or to stabilize the market price of our securities may have the effect of raising or maintaining the market price of our securities or preventing or mitigating a decline in the market price of our securities. As a result, the price of the securities may be higher than the price that might otherwise exist in the open market. The imposition of a penalty bid might also have an effect on the price of shares if it discourages resales of the securities.

If commenced, the underwriters may discontinue any of the activities at any time.

In compliance with guidelines of the Financial Industry Regulatory Authority, or FINRA, the maximum consideration or discount to be received by any FINRA member or independent broker dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

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.

L E G A L M A T T E R S

The validity of the issuance of the securities 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 23,262 shares of our common stock.

E X P E R T S

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, 2009 (including the schedule appearing therein) and the effectiveness of Enzo Biochem, Inc.’s internal control over financial reporting as of July 31, 2009 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 consolidated financial statements are 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, 2009 filed on October 14, 2009;
- Our Quarterly Report on Form 10-Q for the quarter ended April 30, 2010, filed on June 9, 2010, our Quarterly Report on Form 10-Q for the quarter ended January 31, 2010, filed on March 9, 2010 and our Quarterly Report on Form 10-Q for the quarter ended October 31, 2009, filed on December 10, 2009;
- Our Current Reports on Form 8-K filed on October 15, 2009, November 27, 2009, December 11, 2009, January 29, 2010 and May 12, 2010;
- The description of our common stock contained in our registration statement on Form 8-A filed with the SEC on December 8, 1999, including any amendment or reports filed for the purpose of updating such description; and
- All documents we subsequently file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 on or after the date of this prospectus and before the termination of the offering of the securities described in this prospectus, other than documents or information deemed furnished and not filed in accordance with SEC rules.

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.



275,000 Shares of Common Stock

PROSPECTUS SUPPLEMENT

June 29, 2012
