

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

SCHEDULE 14A

Proxy Statement Pursuant to Section 14(a) of the Securities Exchange Act of 1934

Filed by the Registrant S
Filed by a Party other than the Registrant £

Check the appropriate box:

- £ Preliminary Proxy Statement
 £ Confidential, For Use of the Commission Only (as permitted by Rule 14a-6(e)(2))
 S Definitive Proxy Statement
 £ Definitive Additional Materials
 £ Soliciting Material Under Rule 14a-12

Enzo Biochem, Inc.

(Name of Registrant as Specified in Its Charter)

(Name of Person(s) Filing Proxy Statement, if Other Than the Registrant)

Payment of Filing Fee (Check the appropriate box):

- S No fee required
 £ Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.

(1) Title of each class of securities to which transaction applies:

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(2) Form, Schedule or Registration Statement No.:

(3) Filing Party:

(4) Date Filed:

ENZO BIOCHEM, INC.

**527 Madison Avenue
New York, New York 10022**

NOTICE OF 2014 ANNUAL MEETING OF SHAREHOLDERS

To be held on January 21, 2015

To All Shareholders of Enzo Biochem, Inc.:

NOTICE IS HEREBY GIVEN that the 2014 Annual Meeting of Shareholders of Enzo Biochem, Inc., a New York corporation (the “Company”), will be held at The Union League Club, 38 East 37th Street, New York, New York 10016, on January 21, 2015, at 9:00 a.m., New York City time (the “Annual Meeting”), for the following purposes:

1. to elect to the Company’s Board of Directors (the “Board”) as Class III Director, Elazar Rabbani, Ph.D., to hold office for a term of three (3) years or until his respective successor has been duly elected and qualified;
2. to approve, in a nonbinding advisory vote, the compensation of the Company’s Named Executive Officers;
3. to ratify the Company’s appointment of EisnerAmper LLP to serve as the Company’s independent registered public accounting firm for the Company’s fiscal year ending July 31, 2015; and
4. to transact such other business as may properly come before the Annual Meeting or any adjournments or postponements thereof.

All shareholders are cordially invited to attend the Annual Meeting. Please note that you will be asked to present proof that you are a shareholder of the Company as well as valid picture identification, such as a driver’s license or passport, in order to attend the Annual Meeting. The use of cameras, recording devices and other electronic devices will be prohibited at the Annual Meeting.

Whether or not you plan to attend the Annual Meeting, and regardless of the number of shares of common stock you own, you are requested to sign, date and return the enclosed proxy card promptly. Any shareholder of record who submits a proxy card retains the right to revoke such proxy card by: (i) submitting a written notice of such revocation to the President of the Company so that it is received no later than 5:00 p.m. (New York City time) on January 20, 2015; (ii) submitting a duly signed proxy card bearing a later date than the previously signed and dated proxy card to the President of the Company so that it is received no later than 5:00 p.m. (New York City time) on January 20, 2015; or (iii) attending the Annual Meeting and voting in person thereat the shares represented by such proxy card. Attendance at the Annual Meeting will not, in and of itself, constitute revocation of a completed, signed and dated proxy card previously returned. All such later-dated proxy cards or written notices revoking a proxy card should be sent to Enzo Biochem, Inc., 527 Madison Avenue, New York, New York 10022, Attention: Barry W. Weiner, President. If you hold shares in street name, you must contact the firm that holds your shares to change or revoke any prior voting instructions.

Please read carefully the enclosed Proxy Statement, which explains the proposals to be considered by you and acted upon at the Annual Meeting.

Your Board has fixed the close of business on November 24, 2014 as the record date for the determination of holders of record of the Company’s common stock entitled to notice of, and to vote at, the Annual Meeting. A list of shareholders of record of the Company as of the record date will remain open for inspection during the Annual Meeting until the closing of the polls thereat.

We have elected to provide access to our proxy materials over the Internet under the Securities and Exchange Commission's "notice and access" rules. We believe that providing our proxy materials over the Internet allows us to provide our stockholders with the information they need, while reducing our printing and mailing costs and the environmental impact of our Annual Meeting. The Notice of Internet Availability of Proxy Materials (the "Notice") that you received in the mail contains instructions on how to access this proxy statement and the 2014 annual report and vote online. The Notice also includes instructions on how you can request a paper copy of the annual meeting materials. If you want more information, please see the Questions and Answers section of this proxy statement or visit the Annual Stockholders Meeting section of our Investor Relations web site. Your vote is important. Whether or not you plan to attend the Annual Meeting, we hope you will vote as soon as possible. You may vote over the Internet, as well as by telephone or, if you requested to receive printed proxy materials, by mailing a proxy or voting instruction card. Please review the instructions on each of your voting options described in this proxy statement as well as in the Notice you received in the mail.

If you have any questions about the procedures for admission to the Annual Meeting, please contact Investor Relations at (212) 583-0100.

By Order of the Board of Directors,

/s/ Barry W. Weiner

Barry W. Weiner

President, Chief Financial Officer, Principal

Accounting Officer, Treasurer and Director

November 24, 2014

**ALL HOLDERS OF RECORD OF THE COMPANY'S COMMON STOCK (WHETHER THEY
INTEND TO ATTEND THE ANNUAL MEETING OR NOT) ARE STRONGLY
ENCOURAGED TO COMPLETE, SIGN, DATE AND RETURN PROMPTLY THE PROXY
CARD ENCLOSED WITH THE ACCOMPANYING PROXY STATEMENT.**

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ENZO BIOCHEM, INC.
PROXY STATEMENT
2014 ANNUAL MEETING OF SHAREHOLDERS

To be held on January 21, 2015

This Proxy Statement is being furnished to shareholders of record, as of November 24, 2014, of Enzo Biochem, Inc. (“Enzo” or the “Company”), in connection with the solicitation of proxies by the Board of Directors of the Company (the “Board”) for the 2014 Annual Meeting of Shareholders to be held at The Union League Club, 38 East 37th Street, New York, NY 10016, on January 21, 2015, at 9:00 a.m., New York City time (the “Annual Meeting”), and at any adjournments or postponements of the Annual Meeting, for the purposes stated in the accompanying Notice of 2014 Annual Meeting of Shareholders.

Pursuant to the “notice and access” rules adopted by the Securities and Exchange Commission (the “SEC”), the Company has elected to provide stockholders access to its proxy materials over the Internet. Accordingly, the Company will be sending a Notice of Internet Availability of Proxy Materials (the “Notice”) to most stockholders (other than those who previously requested electronic or paper delivery of proxy materials). The Notice will include instructions on how to access the proxy materials over the Internet and how to request a printed copy of these materials. In addition, by following the instructions in the Notice, stockholders may request to receive proxy materials in printed form by mail or electronically by email on an ongoing basis.

If you properly submit your proxy over the Internet, by telephone or by mail (if you request printed copies of the proxy materials) and do not revoke it, the persons named in the enclosed form of proxy will vote the shares for which they are appointed in accordance with the directions of the shareholders appointing them. In the absence of such directions, such shares will be voted “FOR” Proposals 1, 2 and 3 listed in the preceding Notice of Annual Meeting of Shareholders and, in the best judgment of the persons named as proxies, will be voted on any other matters as may come before the Annual Meeting. Any shareholder giving a proxy has the power to revoke the same at any time before it is voted by timely filing written notice of such revocation with the President of the Company, by timely submission of a duly executed proxy bearing a later date or by voting in person at the Annual Meeting. To attend the Annual Meeting and vote in person, please contact Barry W. Weiner at (212) 583-0100. Attendance at the Annual Meeting will not in and of itself constitute revocation of a proxy. Any written notice revoking a proxy should be sent to Enzo Biochem, Inc., 527 Madison Avenue, New York, New York 10022, Attention: Barry W. Weiner.

Choosing to receive your future proxy materials by email will save the Company the cost of printing and mailing documents to you and will reduce the impact of the Company’s annual meetings on the environment. If you choose to receive future proxy materials by email, you will receive an email next year with instructions containing a link to those materials and a link to the proxy voting site. Your election to receive proxy materials by email will remain in effect until you terminate it.

The principal corporate office of the Company is located at 527 Madison Avenue, New York, New York 10022.

The approximate date of mailing to shareholders of the Notice of the 2014 Annual Meeting of Shareholders, this Proxy Statement, the enclosed proxy card and the Company’s 2014 Annual Report to Shareholders is December 4, 2014.

Householding of Annual Meeting Materials

Some brokers and other nominee record holders may be participating in the practice of “householding” this Proxy Statement and other proxy materials. This means that only one copy of this Proxy Statement and other proxy materials may have been sent to multiple shareholders in a shareholder’s household. The Company will promptly deliver additional copies of the Proxy Statement and other proxy materials to any shareholder who contacts the Company’s principal corporate office at 527 Madison Avenue, New York, New York 10022, Attention: Investor Relations at (212) 583-0100 requesting such additional copies. If a shareholder is receiving multiple copies of the Proxy Statement and other proxy materials at the shareholder’s household and would like to receive only a single copy of the Proxy Statement and other proxy materials for a shareholder’s household in the future such shareholders should contact their broker, other nominee record holder, or the Company’s investor relations department to request the future mailing of only a single copy of the Company’s Proxy Statement and other proxy materials.

IMPORTANT NOTICE REGARDING AVAILABILITY OF PROXY MATERIALS

This Proxy Statement, the form of proxy card, our 2014 Annual Report to Shareholders and our Annual Report on Form 10-K for our fiscal year ended July 31, 2014, are available to you on our website at www.enzo.com. Shareholders may also obtain a copy of these materials by writing to Enzo Biochem, Inc., 527 Madison Avenue, New York, New York 10022, Attention: Barry W. Weiner, President. Upon payment of a reasonable fee, shareholders may also obtain a copy of the exhibits to our Annual Report on Form 10-K for our fiscal year ended July 31, 2014.

THE 2014 ANNUAL MEETING

Who is Entitled to Vote at the Annual Meeting

Only holders of record of the Company's common stock, par value \$.01 per share (the "Common Stock"), as of the close of business on November 24, 2014 (the "Record Date") are entitled to notice of, and to vote at, the Annual Meeting. On the Record Date there were issued and outstanding 44,751,599 shares of Common Stock. Each outstanding share of Common Stock is entitled to one (1) vote upon all matters to be acted upon at the Annual Meeting.

How You May Vote

If you are a holder of record of Common Stock as of the Record Date, you may vote by completing, signing, dating and returning the enclosed proxy card by mail. To vote by using the enclosed proxy card, mark your selections on the enclosed proxy card, date the proxy card and sign your name exactly as it appears on your proxy card, and return your proxy card by mail to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, New York 11717.

If you are a holder of record of Common Stock as of the Record Date, you may also vote via the Internet or via telephone. The website for Internet voting is www.proxyvote.com. As with telephone voting, you can confirm that your instructions have been properly recorded. If you vote via the Internet, you also can request electronic delivery of future proxy materials. If you vote via the Internet, please note that there may be costs associated with electronic access, such as usage charges from Internet access providers and telephone companies, for which you will be responsible. You can vote by calling the toll-free telephone number on your proxy card. Easy-to-follow voice prompts allow you to vote your shares and confirm that your instructions have been properly recorded.

If you are a holder of record of Common Stock as of the Record Date, you may also vote by attending the Annual Meeting and voting thereat in person. Votes at the Annual Meeting will be taken by written ballot. At the commencement of the Annual Meeting, we will distribute a written ballot to any shareholder of record who attends the Annual Meeting and wishes to vote thereat in person.

If your shares are held in "street name," whether through a broker, bank or other nominee, only they can sign a proxy card with respect to your shares. You are therefore urged to contact the person responsible for your account and give them instructions for how to complete a proxy card representing your shares so that it can be timely returned on your behalf. You also should confirm in writing your instructions to the person responsible for your account and provide a copy of those instructions to us so that we can attempt to ensure that your instructions are followed. If you wish instead to vote in person at the Annual Meeting, you must obtain a valid proxy from your broker, bank or other nominee.

If you are a holder of record of Common Stock as of the Record Date and plan to attend the Annual Meeting, please be sure to bring with you valid government-issued personal identification with a picture (such as a driver's license or passport) in order to gain admission to the meeting. If your shares are held in "street name" through a bank, broker or other nominee, you will have to bring evidence of your beneficial ownership of Common Stock as of the Record Date, in addition to valid government-issued personal identification, if you wish to attend the meeting. Examples of proof of Common Stock ownership include: a signed letter from your bank or broker stating that you owned your shares as of the Record Date; a brokerage account statement indicating that you owned your shares as of the Record Date; or a copy of the voting instruction card provided by your broker indicating that you owned your shares as of the Record Date. If you are a proxy holder for a holder of record of Common Stock as of the Record Date, then you must also bring the validly executed proxy naming you as the proxy holder, signed by the shareholder of record who owned such shares of Common Stock as of the Record Date.

If you have any questions about the procedures for admission to the Annual Meeting, please contact Investor Relations at (212) 583-0100. Please see "Revocation of Proxies" below for a discussion of how to revoke your proxy.

Quorum; Vote Required

The holders of a majority of the outstanding shares of Common Stock as of the Record Date must be present, in person or represented by proxy, at the Annual Meeting to constitute a quorum for the transaction of business at the Annual Meeting. Abstentions and “broker non-votes” (described below) will be counted for purposes of determining whether there is a quorum for the transaction of business at the Annual Meeting.

The election of a nominee for Director (Proposal 1) requires a plurality of votes cast. This means that so long as a quorum is present, in person or represented by proxy, at the Annual Meeting for the transaction of business, the candidate receiving the most affirmative votes “FOR” his or her election will be elected to serve as a Class III Director of the Company. Shareholders may either vote “FOR” or “WITHHOLD AUTHORITY” to vote for the Director-nominees. A properly executed proxy card marked “WITHHOLD AUTHORITY” and broker non-votes with respect to a Director-nominee will not be voted with respect to the election of that Director-nominee, although they will be counted for purposes of determining whether there is a quorum present at the Annual Meeting for the transaction of business. As a result, such votes will have no effect on the Director election since only votes “FOR” a nominee will be counted.

The approval of Proposal 2 will require the affirmative vote of a majority of the votes cast by holders of shares of Common Stock present, in person or represented by proxy, at the Annual Meeting and entitled to vote on such proposal. Shareholders may either vote “for,” “against” or “abstain” with respect to Proposal 2. While our Board intends to carefully consider the stockholder vote resulting from Proposal 2, the vote is not binding on us and is advisory in nature. Under the rules of the New York Stock Exchange (“NYSE”), abstentions will be counted as “votes cast” and will have the same effect as a vote “against” for the purpose of determining whether a majority of the votes cast have been voted “for” Proposal 2. Broker non-votes will not be counted as “votes cast” on Proposal 2 and will have no effect on the outcome of the vote with respect to Proposal 2.

The ratification and approval of Proposal 3 will require the affirmative vote of a majority of the votes cast by holders of shares of Common Stock present, in person or represented by proxy, at the Annual Meeting and entitled to vote on such proposal. Shareholders may either vote “for,” “against” or “abstain” with respect to Proposal 3. Under the rules of the NYSE, abstentions will be counted as “votes cast” and will have the same effect as a vote “against” for the purpose of determining whether a majority of the votes cast have been voted “for” Proposal 3. Broker non-votes will not be counted as “votes cast” on Proposal 3 and will have no effect on the outcome of the vote with respect to Proposal 3.

If you hold your shares (i.e., they are registered) through a bank, broker or other nominee in “street name” but you do not provide the firm that holds your shares with your specific voting instructions, it will only be allowed to vote your shares on your behalf in its discretion on “routine” matters, but it cannot vote your shares in its discretion on your behalf on any “non-routine” matters. **Please note that the applicable rules of the NYSE that prescribe how brokers may vote your shares have changed.** Under the applicable rules of the NYSE, at the Annual Meeting, Proposal 1 relating to the election of Director and Proposal 2 relating to the nonbinding advisory vote on the Company’s executive compensation are considered “non-routine” matters, and Proposal 3 relating to the appointment of the Company’s independent registered public accounting firm for our fiscal year ending July 31, 2015 is considered a “routine” matter. Therefore, you must give specific instructions to your broker for your shares to be voted on the election of Director (Proposal 1) and the nonbinding advisory vote on the Company’s executive compensation (Proposal 2) at the Annual Meeting.

If you do not give specific instructions to your broker how to vote your shares on your behalf with respect to the election of Director at the Annual Meeting (Proposal 1) or the nonbinding advisory vote on the Company’s executive compensation (Proposal 2) prior to the 10th day prior to the Annual Meeting, your broker will have no discretionary authority to vote your shares on your behalf with respect to the election of Director at the Annual Meeting or the nonbinding advisory vote on the Company’s executive compensation. Such “uninstructed” shares are commonly referred to as “broker non-votes”. With respect to Proposal 3, your broker will have discretionary authority to vote your uninstructed shares “for”, or “against”, or to “abstain” from voting, on the ratification of the appointment of the Company’s independent registered public accounting firm.

Proxy ballots will be received, tabulated and certified at the Annual Meeting by the inspector of election appointed by the Board. The inspector will also determine whether a quorum is present at the Annual Meeting.

Revocation of Proxies

If you are a shareholder of record on the Record Date and have signed, dated and returned a proxy card, you may revoke such proxy card in your discretion by:

- submitting a written notice of such revocation to the President of the Company so that it is received no later than 5:00 p.m. (New York City time) on January 20, 2015;
- submitting a duly signed proxy card bearing a later date than the previously signed and dated proxy card to the President of the Company so that it is received no later than 5:00 p.m. (New York City time) on January 20, 2015; or
- attending the Annual Meeting and voting in person thereat the shares represented by such proxy card (but attendance at the Annual Meeting will not, in and of itself, constitute revocation of a completed, signed and dated proxy card previously returned).

All such later-dated proxy cards or written notices of revocation of a proxy card should be sent to Enzo Biochem, Inc., 527 Madison Avenue, New York, New York 10022, Attention: Barry W. Weiner, President. If you hold shares in street name, you must contact the firm that holds your shares to change or revoke any prior voting instructions.

Voting

The persons named as proxies in the enclosed proxy card will vote the shares for which such persons were thereby appointed in accordance with the voting indications marked thereon by the shareholders who signed, dated and returned such card. If, however, such proxy card is signed, dated and returned to the Company but no voting indications are marked thereon, all shares represented by such proxy card will be voted by the proxies named therein "FOR" the election of the Board's Class III Director-nominee, Elazar Rabbani, Ph.D. (Proposal 1), "FOR" the approval of the compensation of our Named Executive Officers, as disclosed in this Proxy Statement (Proposal 2), and "FOR" the ratification of the Company's appointment of EisnerAmper LLP to serve as the Company's independent registered public accounting firm for its fiscal year ending July 31, 2015 (Proposal 3), and will be voted on any other matters as may come before the Annual Meeting in the best judgment and discretion of the persons named as proxies.

You can find the official results of voting at the Annual Meeting in our Current Report on Form 8-K to be filed within four business days after the Annual Meeting. If the official results are not available at that time, we will provide preliminary voting results in the Form 8-K and will provide the final results in an amendment to the Form 8-K as soon as they become available.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

Set forth below is information concerning stock ownership of all persons known by the Company to own beneficially 5% or more of the shares of Common Stock of the Company, the executive officers named in the “Summary Compensation Table” as “Named Executive Officers,” all current Directors and the Board’s Class III Director-nominee, and all current Directors and executive officers of the Company as a group, based upon the number of outstanding shares of Common Stock as of the close of business on November 24, 2014.

The percentages in the “Percent of Class” column are calculated in accordance with the rules of the SEC, under which a person may be deemed to be the beneficial owner of shares if that person has or shares the power to vote or dispose of those shares or has the right to acquire beneficial ownership of those shares within 60 days (for example, through the exercise of an option or warrant). Accordingly, the shares shown in the table as beneficially owned by certain individuals may include shares owned by certain members of their respective families. Because of these rules, more than one person may be deemed to be the beneficial owner of the same shares. The inclusion of the shares shown in the table is not necessarily an admission of beneficial ownership of those shares by the person indicated. Except as otherwise indicated, each of the persons named has sole voting and investment power with respect to the shares shown.

| Name and Address of Beneficial Owner | Amount and Nature of Beneficial Ownership (1) | Percent of Class (2) |
|---|--|-------------------------|
| Elazar Rabbani, PhD | 1,824,701 (3) | 4.0% |
| Barry W. Weiner | 1,251,279 (4) | 2.8% |
| James M. O’Brien | — | * |
| David C. Goldberg | 120,936 (5) | * |
| Paul C. O’Brien | 21,837 (6) | * |
| Gregory M. Bortz | 158,663 (7) | * |
| Bernard L. Kasten, M.D | 156,445 (8) | * |
| Dov Perlysky | 712,388 (9) | 1.6% |
| RA Capital Management LLC | 2,268,653 (10) | 5.1% |
| BlackRock Institutional Trust Company, NA | 2,400,029 (11) | 5.4% |
| Rosalind Davidowitz | 3,729,088 (12) | 8.3% |
| All Directors and executive officers as a group (8 persons) | 4,246,249 (13) | 9.3% |

* Represents beneficial ownership of less than 1%.

- (1) Except as otherwise noted, all shares of Common Stock are beneficially owned and the sole investment and voting power is held by the persons named, and such persons’ address is c/o Enzo Biochem, Inc., 527 Madison Avenue, New York, New York 10022.
- (2) Based upon 44,751,599 shares of Common Stock of the Company outstanding as of the close of business on the Record Date. Common Stock not outstanding but deemed beneficially owned by virtue of the right of an individual to acquire shares within 60 days from the date hereof is treated as outstanding only when determining the amount and percentage of Common Stock owned by directors and executive officers individually and as a group.
- (3) Includes (i) 218,413 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof, (ii) 5,472 shares of Common Stock held in the name of Dr. Rabbani as custodian for certain of his children, (iii) 20,638 shares of Common Stock held in the name of Dr. Rabbani’s wife as custodian for certain of their children, and (iv) 23,374 shares of Common Stock held in the Company’s 401(k) plan.
- (4) Includes (i) 159,955 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof, (ii) 3,638 shares of Common Stock that Mr. Weiner holds as custodian for certain of his children and (iii) 23,382 shares of Common Stock held in the Company’s 401(k) plan.

- (5) Includes (i) 28,076 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof and (ii) 3,333 shares of restricted stock vesting within 60 days from the date hereof and (iii) 18,104 shares of Common Stock held in the Company's 401(k) plan.
- (6) Includes (i) 11,699 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof and (ii) 10,138 shares of Common Stock held in the Company's 401(k) plan.
- (7) Includes 91,598 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof.
- (8) Includes 91,598 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof.
- (9) Includes (i) 91,598 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof; (ii) 30,000 shares owned by Laya Perlysky in an IRA account, Laya Perlysky is Mr. Perlysky's wife. Mr. Perlysky disclaims beneficial ownership of such shares; (iii) 18,250 shares owned by Irwin Dov Perlysky IRA. Also includes (iv) 525,826 shares owned directly by RSD 2010 GRAT, of which Mr. Perlysky is the trustee; (v) 45,000 shares owned by Sky Ventures LLC, of which Mr. Perlysky is the manager; and (vi) 1,714 shares owned by Mr. Perlysky. Does not include shares owned by Mrs. Rosalind Davidowitz, who is Mr. Perlysky's mother-in-law.
- (10) The address of RA Capital Management LLP is 20 Park Plaza, Suite 1200, Boston, MA 02116. This information is based solely on a Schedule 13G filed on February 14, 2014.
- (11) The address of BlackRock Institutional Trust Company, NA is 40 East 52nd Street, New York 10022. This information is based solely on a Schedule 13F filed on September 30, 2014.
- (12) Mrs. Davidowitz's address is 7 Sutton Place South, Lawrence, New York, 11559. Includes (i) 1,993,708 shares owned by Mrs. Davidowitz, (ii) 381,713 shares owned directly by Mr. J. Morton Davis, Mrs. Davidowitz's husband, (iii) 1,216,196 shares owned by Engex, Inc., (iv) 124,738 shares owned by the Morton Foundation and (v) 12,733 shares owned by an investment advisor whose principal is Mr. Davis. This information is based solely on a Schedule 13G filed on February 6, 2014. This amount does not include shares owned by Mr. Perlysky, who is Mrs. Davidowitz's son-in-law or shares owned by Laura Perlysky in an IRA account. Laura Perlysky is Mrs. Davidowitz's daughter.
- (13) Includes 692,936 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof and 3,333 shares of restricted stock vesting within 60 days from the date hereof.

PROPOSAL 1 ELECTION OF DIRECTORS

The Company's Board has three staggered classes of Directors, each of which serves for a term of three years. At the Annual Meeting, the Board's Class III Director will be elected to hold office for a term of three years or until the respective successor is elected and qualified. Unless otherwise instructed, the shares represented by validly submitted proxy cards will be voted "FOR" the election of the below-listed Board nominee to serve as Class III Director of the Company. Management has no reason to believe that the below-listed Board nominee will not be candidate or will be unable to serve as Class III Director. However, in the event that the below-listed Board nominee should become unable or unwilling to serve as Class III Director, the proxy card will be voted for the election of such alternate person as shall be designated by the Class I and Class II Directors currently on the Board. If any alternate person(s) is/are designated by the Class I and Class II Directors currently on the Board to serve as Class III Director-nominee(s), the Company will publicly notify shareholders by press release and will promptly distribute to shareholders revised proxy materials (including a revised proxy card) that (i) identify each such substitute nominee, (ii) disclose whether such substitute nominee has consented to being named in the revised proxy statement and to serve if elected and (iii) include certain other disclosure required by applicable federal proxy rules and regulations with respect to each such substitute nominee.

The total cumulative length of time that any Outside Director (a member of the Board who is not an officer or employee of the Company) may serve on the Board is limited to a maximum of three three-year terms, whether consecutively or in total, plus any portion of an earlier three-year term that such Outside Director may have been appointed to serve.

**CLASS III DIRECTOR NOMINEE TO SERVE UNTIL
THE 2017 ANNUAL MEETING, IF ELECTED:**

Class III: Term to Expire In 2018

| Name | Age | Year First Became a Director |
|-----------------------|-----|---------------------------------|
| Elazar Rabbani, Ph.D. | 71 | 1976 |

ELAZAR RABBANI, Ph.D. is an Enzo Biochem founder and has served as the Company’s Chairman of the Board and Chief Executive Officer since its inception in 1976 and Secretary since November 25, 2009. Dr. Rabbani has authored numerous scientific publications in the field of molecular biology, in particular, nucleic acid labeling and detection. He is also the lead inventor of many of the Company’s pioneering patents covering a wide range of technologies and products. Dr. Rabbani received his Bachelor of Arts degree from New York University in Chemistry and his Ph.D. in Biochemistry from Columbia University. He is a member of the American Society for Microbiology.

The Company is nominating Dr. Rabbani to serve as a Class III Director and we believe that Dr. Rabbani’s qualifications to serve on our Board are demonstrated by his extensive knowledge of our industry, accomplishments over the last 38 years, including building our Intellectual Property estate and the commercialization of technology which has generated significant revenues for the Company.

THE BOARD OF DIRECTORS OF THE COMPANY UNANIMOUSLY RECOMMENDS THAT YOU VOTE “FOR” THE ELECTION OF THE ABOVE-NAMED BOARD NOMINEE TO SERVE AS CLASS III DIRECTOR OF THE COMPANY.

DIRECTORS WHO ARE CONTINUING IN OFFICE:

Class I: Term to Expire In 2016

| Name | Age | Year First Became a Director |
|------------------|-----|------------------------------------|
| Gregory M. Bortz | 45 | 2010 |
| Dov Perlysky | 52 | 2012 |

Class II: Term to Expire In 2017

| Name | Age | Year First Became a Director |
|-------------------------|-----|------------------------------------|
| Barry W. Weiner | 64 | 1977 |
| Bernard L. Kasten, M.D. | 68 | 2008 |

DIRECTORS, EXECUTIVE OFFICERS AND KEY EMPLOYEES

The current Directors, executive officers and key employees of the Company and its subsidiaries are identified in the table below.

| Name | Age | Year Became a Director or Executive Officer | Position |
|-------------------------|-----|--|---|
| Elazar Rabbani, Ph.D. | 71 | 1976 | (1) Chairman of the Board, Chief Executive Officer and Secretary President, Chief Financial Officer, Principal Accounting Officer, Treasurer and Director |
| Barry W. Weiner | 64 | 1977 | |
| James M. O'Brien | 48 | 2014 | Senior Vice President, Finance |
| David C. Goldberg | 57 | 1995 | Vice President, Corporate Development |
| Paul C. O'Brien | 52 | 2009 | Vice President, Global Human Resources |
| Gregory M. Bortz | 45 | 2010 | Director |
| Bernard L. Kasten, M.D. | 68 | 2008 | Director |
| Dov Perlysky | 52 | 2012 | Director |

(1) Director term expires January 21, 2015.

Biographical Information Regarding Directors, Executive Officers and Key Employees

ELAZAR RABBANI, Ph.D. is an Enzo Biochem founder and has served as the Company's Chairman of the Board and Chief Executive Officer since its inception in 1976 and Secretary since November 25, 2009. Dr. Rabbani has authored numerous scientific publications in the field of molecular biology, in particular, nucleic acid labeling and detection. He is also the lead inventor of many of the Company's pioneering patents covering a wide range of technologies and products. Dr. Rabbani received his Bachelor of Arts degree from New York University in Chemistry and his Ph.D. in Biochemistry from Columbia University. He is a member of the American Society for Microbiology.

We believe that Dr. Rabbani's qualifications to serve on our Board are demonstrated by his extensive knowledge of our industry, accomplishments over the last 37 years, including building our Intellectual Property estate and the commercialization of technology which has generated significant revenues for the Company.

BARRY W. WEINER, President, Chief Financial Officer, Principal Accounting Officer and Director and a founder of Enzo Biochem. He has served as the Company's President since 1996, and previously held the position of Executive Vice President. Before his employment with Enzo Biochem, he worked in several managerial and marketing positions at the Colgate Palmolive Company. Mr. Weiner is a member of the New York Biotechnology Association. He received his Bachelor of Arts degree in Economics from New York University and his Master of Business Administration in Finance from Boston University.

We believe that Mr. Weiner's qualifications to serve on our Board are demonstrated by his knowledge of our businesses and the industries in which we are involved, along with his experience in finance, management and marketing, including the identification of acquisition targets and raising capital.

JAMES M. O'BRIEN, Senior Vice President, Finance joined Enzo Biochem, Inc. in February 2014 and is responsible for leading and managing all activities for our Corporate and Business Unit Financial functions. Mr. O'Brien has held leadership positions for Corporate and Business Unit budgeting and forecasting, SEC Reporting, Internal Controls and Accounting Operations for large and small multi-national public companies in pharmaceutical, consumer products and manufacturing industries. From 2010 to 2013 Mr. O'Brien was Vice President and Corporate Controller for Actavis, plc. (formally Watson Pharmaceuticals) a global specialty pharmaceutical company. From 1998 to 2010, Mr. O'Brien held senior level Finance leadership roles at Nycomed US, Aptuit, Inc., Purdue Pharma LLP and Bristol Myers Squibb Company. From 1988 to 1998 Mr. O'Brien was with PricewaterhouseCoopers LLP. He received his Bachelor of Arts degree from George Washington University and his Master of Business Administration from Fordham University. Mr. O'Brien is a Certified Public Accountant.

DAVID C. GOLDBERG, Vice President of Corporate Development for Enzo Biochem, Inc., has been employed with the Company since 1985. During fiscal year 2013 Mr. Goldberg served as Interim General Manager of Enzo Clinical Labs. He also held several other managerial positions within Enzo Biochem. Mr. Goldberg also held management and marketing positions with DuPont-NEN and Gallard Schlesinger Industries before joining the Company. He received his Master of Science degree in Microbiology from Rutgers University and his Master of Business Administration in Finance from New York University.

PAUL C. O'BRIEN, Vice President of Global Human Resources for Enzo Biochem Inc. since November 2009. Before joining the Company, Mr. O'Brien was Vice President of Global Human Resources at Black & Decker for its Fastening and Assembly Systems Group from 2005 to 2009. From 2003 to 2004, Mr. O'Brien was Director of Global Human Resources for Stryker Spine and from 1991 to 2002 Mr. O'Brien held various roles in Human Resources with Tyco Healthcare, the latest of which was Senior Director, Divisional Human Resources. He received his Bachelor of Arts degree in General Studies from Providence College.

BERNARD L. KASTEN M.D. has been a Director of the Company since September 2008 and serves on the Audit, Nominating/Governance and the Compensation Committees and since January 2011 serves as the Lead Independent Director and Chairman of the Compensation Committee. Dr. Kasten served as a director, Executive Chairman and CEO of GeneLink Inc., which filed for bankruptcy in April 2014. He served as Chairman of the Board of Cleveland Biolabs, Inc. (CBLI: NASDAQ) from 2006 to 2013. From 1996 to 2004, Dr. Kasten served at Quest Diagnostics Incorporated (DGX: NYSE) where he was Chief Laboratory Officer, Vice President of Business Development for Science and Medicine and most recently as Vice President of Medical Affairs of its MedPlus Inc. subsidiary. Dr. Kasten served as a Director of SIGA Technologies (SIGA: NASDAQ) from May 2003 to December 2006, and as SIGA's Chief Executive Officer from July 2004 through April 2006. Dr. Kasten is a graduate of the Ohio State University College of Medicine. His residency was served at the University of Miami, Florida and he was awarded fellowships at the National Institutes of Health Clinical Center (NCI), Bethesda, Maryland. He is a diplomat of the American Board of Pathology with certification in Anatomic and Clinical Pathology and sub-specialty certification in Medical Microbiology.

We believe that Dr. Kasten's qualifications to serve on our Board are demonstrated by his professional background, experience in the healthcare field, including his prior senior leadership positions at Quest Diagnostics and other medical and biotech related companies, and current and past public company board positions.

GREGORY M. BORTZ, has been a Director of the Company since January 2010 and currently serves on the Audit, Compensation and Nominating/Governance Committees and since November 2010 has served as the Chairman of the Audit Committee. Mr. Bortz is the founder of and has been the managing partner of Creo Capital Partners, LLC, ("CREO") a private equity firm that provides capital to middle-market companies, since February 2005. CREO holds investments in companies certain of which Mr. Bortz serves as a board member. In addition, Mr. Bortz serves as the Chief Investment Officer of the CREO Select Opportunities Fund, a hedge fund that invests in public fixed income and equity securities. From October 2000 to February 2005, Mr. Bortz was Senior Vice President, Investment Banking Division of the international investment bank Lehman Brothers, Inc. Prior to such position he was a Vice President of Investment Banking at Credit Suisse First Boston, an international investment bank, from January 1998 to October 2000.

Mr. Bortz held the position of Manager at the accounting firm of Ernst and Young (1994–1997) and Senior at the public accounting firm of Arthur Andersen (1993–1994), both in their respective audit groups. Mr. Bortz was qualified as a chartered accountant in England and Wales, and South Africa, and graduated from the University of Cape Town with a Bachelors of Business Science with Honors in Finance and Postgraduate Diploma in Accounting.

We believe that Mr. Bortz’s qualifications to serve on our Board are demonstrated by his more than 19 years of financial and investment banking experience and experience serving as a board member of portfolio companies.

DOV PERLYSKY has been a Director of the Company since September 2012 and since January 2013 has served on the Audit, Nominating/Governance and Audit Committees and chairs the Nominating/Governance committee. Mr. Perlysky has been serving as a member of the Board of Directors of Pharma-Bio Serv, Inc. since 2004, Highlands State Bank since 2010, News Communications since 2007, and Oaktree Educational Partners since 2009. Mr. Perlysky has also been the managing member of Neshor, LLC, a private investment firm, since 2000 and a director of Engex, Inc., a closed-end mutual fund, since 1999. From 1998 until 2002, Mr. Perlysky was a vice president in the private client group of Laidlaw Global Securities, a registered broker-dealer. Mr. Perlysky received his Bachelor of Science in Mathematics and Computer Science from the University of Illinois in 1985 and his Master of Science in Management Studies from the J.L. Kellogg School of Management of Northwestern University in 1991. Mr. Perlysky is the son-in-law of Rosalind Davidowitz, see “Security Ownership of Certain Beneficial Owners and Management” on page 6 and footnotes 9 and 11 thereof. The Company believes that Mr. Perlysky is independent under the rules of the NYSE.

We believe that Mr. Perlysky’s qualifications to serve on our Board are demonstrated by his professional background, experience in the healthcare field, including his director positions at Pharma-Bio Serv, Inc., other current and past board positions and finance background, making him well qualified as a member of our Board.

Family Relationships

Dr. Elazar Rabbani and Barry W. Weiner are brothers-in-law.

Messrs. James M. O’Brien and Paul C. O’Brien have no family relationship.

Director Independence

Messrs. Gregory M. Bortz and Dov Perlysky and Dr. Bernard L. Kasten qualify as “independent Directors” under the criteria established by the NYSE.

THE BOARD OF DIRECTORS OF THE COMPANY UNANIMOUSLY RECOMMENDS THAT YOU VOTE “FOR” THE ELECTION OF THE ABOVE-NAMED BOARD NOMINEE TO SERVE AS CLASS III DIRECTOR OF THE COMPANY.

CORPORATE GOVERNANCE

Our Board and management are committed to responsible corporate governance to ensure that the Company is managed for the long-term benefit of its shareholders. To that end, during the past year, as in prior years, the Board and management have periodically reviewed and updated, as appropriate, the Company's corporate governance policies and practices. During the past year, the Board has also continued to evaluate and, when appropriate, update the Company's corporate governance policies and practices in accordance with the requirements of the Sarbanes-Oxley Act of 2002 and the rules and listing standards issued by the Securities and Exchange Commission and the NYSE.

Corporate Governance Policies and Practices

The Company has a variety of policies and practices to foster and maintain responsible corporate governance, including the following:

Corporate Governance Guidelines—The Board adopted Corporate Governance Guidelines, which collect in one document many of the corporate governance practices and procedures that had evolved over the years. These guidelines address the duties of the Board, Director qualifications and selection process, Board operations, Board committee matters and continuing education. The guidelines also provide for annual self-evaluations by the Board and its committees. The Board reviews these guidelines on an annual basis. The guidelines are available on the Company's website at www.enzo.com, and in print to any interested party that requests them by contacting Investor Relations at (212) 583-0100.

Corporate Code of Ethics—The Company has a Code of Ethics that applies to all of the Company's employees, officers and members of the Board. The Code of Ethics is available on the Company's website at www.enzo.com, and in print to any interested party that requests it.

Board Committee Charters—Each of the Company's Audit, Compensation and Nominating/Governance Committees has a written charter adopted by the Company's Board that establishes practices and procedures for such committee in accordance with applicable corporate governance rules and regulations. The charters are available on the Company's website at www.enzo.com, and in print to any interested party that requests them.

Lead Independent Director Charter—The duties of the Lead Independent Director, as set forth in the Lead Independent Director Charter, among other things, are to develop the agendas for and serve as chairman of the executive sessions of the independent Directors of the Company; serve as principal liaison between the independent Directors of the Company and the Chairman of the Board and between the independent Directors and senior management; provide the Chairman of the Board with input as to the preparation of the agendas for Board meetings; advise the Chairman of the Board as to the quality, quantity and timeliness of the information submitted by the Company's management that is necessary or appropriate for the independent Directors to effectively and responsibly perform their duties; ensure that independent Directors have adequate opportunities to meet and discuss issues in executive sessions without management present; if the Chairman of the Board is unable to attend a Board meeting, act as chairman of such Board meeting; and perform such other duties as the Board shall from time to time delegate.

Bernard L. Kasten, M.D. has served as Lead Independent Director since March 2011. The Lead Director role was established in October 2005.

The Lead Independent Director Charter is available on the Company's website at www.enzo.com, and in print to any interested party that requests it by contacting Investor Relations at (212) 583-0100.

Director Independence

Requirements - The Board believes that a majority of its members should be independent, non-employee Directors. The Board adopted the following "Director Independence Standards," which are consistent with criteria established by the NYSE, to assist the Board in making these independence determinations:

No Director can qualify as independent if he or she has a material relationship with the Company outside of his or her service as a Director of the Company. A Director is not independent if, within the preceding three years:

- The Director was an employee of the Company;
- An immediate family member of the Director was an executive officer of the Company;
- A Director was affiliated with or employed by a present or former internal or external auditor of the Company;
- An immediate family member of a Director was affiliated with or employed in a professional capacity by a present or former internal or external auditor of the Company;
- A Director, or an immediate family member of the Director, received more than \$120,000 per year in direct compensation from the Company, other than Director and committee fees and pension or other forms of deferred compensation for prior services (provided such compensation is not contingent in any way on continued service);
- The Director, or an immediate family member of the Director, was employed as an executive officer of another company where any of the Company's executives served on that company's compensation committee of the board of Directors;
- The Director was an executive officer or employee, or an immediate family member of the Director was an executive officer, of another company that made payments to, or received payments from, the Company for property or services in an amount which, in any single fiscal year, exceeded the greater of \$1 million or two percent (2%) of such other company's consolidated gross revenues;
- The Director, or an immediate family member of the Director, was an executive officer of another company that was indebted to the Company, or to which the Company was indebted, where the total amount of either company's indebtedness to the other was five percent (5%) or more of the total consolidated assets of the Company he or she served as an executive officer; or
- The Director, or an immediate family member of the Director, was an officer, Director or trustee of a charitable organization where the Company's annual discretionary charitable contributions to the charitable organization exceeded the greater of \$1 million or two percent (2%) of that organization's consolidated gross revenues.

The Board has reviewed all material transactions and relationships among each Director, or any member of his or her immediate family, and the Company, its senior management and its independent auditors. Based on this review and in accordance with its independence standards outlined above, the Board has affirmatively determined that all of the non-employee Directors are independent.

Board Leadership Structure and Role in Risk Oversight

Elazar Rabbani, Ph.D. has been the Company's Chairman of the Board and Chief Executive Officer since the Company's inception in 1976. The Company believes that having one person, particularly Dr. Rabbani with his deep industry and executive management experience, his extensive knowledge of the operations of the Company and his own history of innovation and strategic thinking, serve as both Chief Executive Officer and Chairman is the best leadership structure for the Company because it demonstrates to employees, customers and stockholders that the Company is under strong leadership, with a single person setting the tone and having primary responsibility for managing the Company's operations. This unity of leadership promotes strategy development and execution, timely decision-making and effective management of Company resources. The Company believes that it has been well served by this structure.

As described above, three of the Company's five Directors are independent. In addition, all of the directors on each of the Audit Committee, Compensation Committee and Nominations and Corporate Governance Committee are independent directors and each of these committees is led by a committee chair. The committee chairs set the agendas for their committees and report to the full Board. All of the independent Directors are highly accomplished and experienced business people in their respective fields, who have demonstrated leadership in significant enterprises and are familiar with board processes. The Company's independent Directors bring experience, oversight and expertise from outside the company and industry, while the Company's Chairman and Chief Executive Officer and Mr. Weiner, as President and Chief Financial Officer bring company-specific experience and expertise.

Additionally, as described above in more detail, the Company has had a Lead Independent Director since October 2005, whose duties, among other things, are to lead the executive sessions of the independent Directors of the Company; serve as liaison between the independent Directors of the Company on the other hand and the Chairman of the Board and senior management on the other hand advise the Chairman of the Board as to the quality, quantity and timeliness of the information submitted by the Company's management to the independent Directors; and perform such other duties as the Board shall from time to time delegate.

While the Board is responsible for overseeing the Company's risk management, the Board has delegated many of these functions to the Audit Committee. Under its charter, the Audit Committee is responsible for discussing with management and the independent auditors the Company's major financial risk exposures, the guidelines and policies by which risk assessment and management is undertaken, and the steps management has taken to monitor and control risk exposure. In addition to the Audit Committee's work in overseeing risk management, the full Board regularly engages in discussions regarding the most significant risks that the Company is facing and how those risks are being managed, and the Board receives risk management updates directly from senior management of the Company and from the chair of the Audit Committee. In addition, the Chairman and Chief Executive Officer's extensive knowledge of the Company and experience in the industries we operate uniquely qualifies him to lead the Board in assessing the whole panoply of risks to the Company. The Board believes that the work undertaken by the Audit Committee, the full Board and the Chairman and Chief Executive Officer, enables the Board to effectively oversee the Company's risk management function.

Board Nomination Policies and Procedure

Nomination Procedure—The Nominating/Governance Committee is responsible for identifying, evaluating and recommending candidates for election to the Board, with due consideration for recommendations made by other Board members, the CEO and other sources. In addition to the above criteria, the Nominating/Governance Committee also considers the appropriate balance of experience, skills, and characteristics desirable among the members of the Board to maintain a diverse Board of Directors. The independent members of the Board review the Nominating/Governance Committee candidates and nominate candidates for election by the Company shareholders. The Nominating/Governance Committee will consider candidates for election to the Board recommended by shareholders of the Company. The procedures for submitting shareholder recommendations are explained below under "Shareholder Proposals" on page 39.

Directors must also possess the highest personal and professional ethics, integrity and values and be committed to representing the long-term interests of all shareholders. Board members are expected to diligently prepare for, attend and participate in Board and applicable Committee meetings. Each Board member is expected to ensure that other existing and future commitments do not materially interfere with the member's service as a Director.

The Nominating/Governance Committee also reviews whether a potential candidate will meet the Company's independence standards and any other Director or committee membership requirements imposed by law, regulation or stock exchange rules.

Director candidates recommended to the Committee are subject to full Board approval and subsequent election by the shareholders. The Board is also responsible for electing Directors to fill vacancies on the Board that occur due to retirement, resignation, expansion of the Board or other reasons between the Shareholders' annual meetings. The Nominating/Governance Committee may retain a recruitment firm, from time to time, to assist in identifying and evaluating Director candidates. When a firm is used, the Committee provides specified criteria for Director candidates, tailored to the needs of the Board at that time, and pays the firm a fee for these services. Suggestions for Director candidates are also received from Board members and management and may be solicited from professional associations as well.

Board Committees

All members of each of the Company's three standing committees—Audit, Compensation, and Nominating/Governance—are required to be independent in accordance with NYSE criteria. See below for a description of the responsibilities of the Board's standing committees.

Executive Sessions of Non-Management Directors

The Board and each of the Audit, Compensation and Nominating/Governance Committees periodically hold meetings of only the independent Directors or Committee members without management present.

Board Access to Independent Advisors

The Board as a whole, and each of the Board committees separately, has authority to retain and terminate such independent consultants, counselors or advisors to the Board as each shall deem necessary or appropriate.

Communications with Board of Directors

Direct Communications—Any interested party desiring to communicate with the Board or with any Director regarding the Company may write to the Board or the Secretary c/o Elazar Rabbani, Office of the Secretary, Enzo Biochem, Inc., 527 Madison Avenue, New York New York 10022. The Office of the Secretary will forward all such communications to the Director(s). Interested parties may also submit an email by filling out the email form on the Company's website at www.enzo.com. Moreover, any interested party may contact the non-management Directors of the Board and/or the Lead Director.

Annual Meeting—The Company encourages its outside Directors to attend the annual meeting of shareholders each year. Messrs. Bortz and Perlysky and Dr. Kasten attended the Annual Meeting of Shareholders held in January 2014.

Meetings of the Board of Directors and its Committees

During the fiscal year ended July 31, 2014, there were six formal meetings of the Board of Directors, several actions by unanimous consent and several informal meetings. None of the Directors attended less than 75% of the meetings. Currently, the Board of Directors has a Nominating/Governance Committee, an Audit Committee and a Compensation Committee. The Nominating/Governance Committee had one formal meeting, the Audit Committee had five formal meetings and the Compensation Committee had one formal meeting.

The Audit Committee was established by and among the Board for the purpose of overseeing the accounting and financial reporting processes of the Company and audits of the financial statements of the Company in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934 (the "Exchange Act"), as amended. The Audit Committee is authorized to review proposals of the Company's auditors regarding the annual audit, recommend the engagement or discharge of the auditors, review recommendations of such auditors concerning accounting principles and the adequacy of internal controls and accounting procedures and practices, review the scope of the annual audit, approve or disapprove each professional service or type of service other than standard auditing services to be provided by the auditors, and review and discuss the audited financial statements with the auditors. The current members of the Audit Committee are Messrs. Bortz and Perlysky and Dr. Kasten. Mr. Bortz has been the Chairman since November 2010. The Board has determined that each of the Audit Committee members is independent, as defined in the NYSE's listing standards. The Board has further determined that Mr. Bortz is an "audit committee financial expert" as such term is defined under Item 407(d)(5)(ii) of Regulation S-K.

The Compensation Committee has the power and authority to (i) establish a general compensation policy for the officers and employees of the Company, including to establish and at least annually review executive officers' salaries and non-equity incentive compensation plan program and levels of officers' participation in the benefit plans of the Company, (ii) prepare any reports that may be required by the regulations of the Securities and Exchange Commission or otherwise relating to officer compensation, (iii) approve any increases in Directors' fees, (iv) grant stock options and/or other equity instruments authorized by senior executives for non-executive officers and (v) exercise all other powers of the Board with respect to matters involving the compensation of employees and the employee benefits of the Company as shall be delegated by the Board to the Compensation Committee. The current members of the Compensation Committee are Messrs. Bortz and Perlysky and Dr. Kasten. Dr. Kasten has been the Chairman since January 2011.

The Nominating/Governance Committee has the power to recommend to the Board prior to each annual meeting of the shareholders of the Company: (i) the appropriate size and composition of the Board; and (ii) nominees: (1) for election to the Board for whom the Company should solicit proxies; (2) to serve as proxies in connection with the annual shareholders' meeting; and (3) for election to all committees of the Board other than the Nominating/Governance Committee. The Nominating/Governance Committee will consider nominations from the shareholders, provided that they are made in accordance with the Company's By-laws. When evaluating prospective Director candidates, the Nominating/Governance Committee conducts individual evaluations against the criteria stated in the committee's charter. All Director candidates, regardless of the source of their nomination, are evaluated using the same criteria. The current members of the Nominating/Governance Committee are Dr. Kasten and Messrs. Bortz and Perlysky. Mr. Perlysky has been the Chairman since January 2013.

AUDIT COMMITTEE REPORT

In connection with the preparation and filing of the Company's Annual Report on Form 10-K for its fiscal year ended July 31, 2014:

- (1) The Audit Committee reviewed and discussed the audited financial statements and related footnotes with management and EisnerAmper LLP, the current independent registered public accounting firm. Management represented to the Audit Committee that the Company's financial statements were prepared in accordance with U.S. generally accepted accounting principles;
- (2) The Audit Committee discussed with the independent registered public accountants matters required to be discussed under PCAOB Auditing Standard No. 16;
- (3) The Audit Committee reviewed the written disclosures and the letter from the independent registered public accountants required by the applicable requirements of the Public Company Accounting Oversight Board, as may be modified or supplemented, regarding the independent registered public accounting firm's communication with the Audit Committee concerning independence and discussed with EisnerAmper LLP their independence;

- (4) The Audit Committee discussed with the Company's independent registered public accountants the overall scope and plans for its audit. The Audit Committee met with the independent registered public accountants with and without management present, to discuss the results of their examinations, their evaluations of the Company's internal controls, and the overall quality (and not merely the acceptability) of the Company's accounting principles and financial reporting, the reasonableness of significant estimates and judgments, and the disclosures in the Company's financial statements, including the disclosures relating to critical accounting policies. The Audit Committee held five formal meetings during the fiscal year ended July 31, 2014 with the independent registered public accounting firms; and
- (5) Based on the review and discussions referred to above, the Audit Committee recommended to the Board that the audited financial statements be included in the Company's Annual Report on Form 10-K for the fiscal year ended July 31, 2014 for filing with the SEC. We also selected EisnerAmper LLP as the independent registered public accounting firm for fiscal 2015. The Board is recommending that shareholders ratify that selection at the Annual Meeting.

Submitted by the members of the Audit Committee on October 2, 2014:

Gregory M. Bortz, Chairman
Bernard L. Kasten, MD.
Dov Perlysky

SECTION 16(A) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Exchange Act requires the Company's executive officers, Directors and persons who beneficially own more than 10% of a registered class of the Company's equity securities (collectively, "Reporting Persons") to file with the Securities and Exchange Commission initial reports of ownership and reports of changes in ownership of common stock and other equity securities of the Company within two business days. Such executive officers, Directors and greater than 10% beneficial owners are required by Securities and Exchange Commission regulation to furnish the Company with copies of all Section 16(a) forms filed by such Reporting Persons. Dr. Kasten disposed of shares of Common Stock on March 31, 2014 and April 10, 2014 which were reported one day late and on July 16, 2014 which was reported three days late.

CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

Enzo Clinical Labs, Inc. ("Enzo Lab"), a subsidiary of the Company, leases a facility located in Farmingdale, New York from Pari Management Corporation ("Pari"). Pari is owned equally by Elazar Rabbani, Ph.D., Shahram K. Rabbani, a former officer and Director of the Board, and Barry Weiner and his wife, who are the officers and directors of Pari. The lease originally commenced on December 20, 1989, but was amended and extended in March 2005 and now terminates on March 31, 2017. During fiscal year ended July 31, 2014, Enzo Lab paid approximately \$1,649,000 to Pari with respect to such facility and future payments are subject to cost of living adjustments.

The non-interested members of the Board of Directors, at the time of the lease signing, reviewed and approved this transaction in accordance with the Company's procedures for reviewed related party transactions. The Company, which has guaranteed Enzo Lab's obligations to Pari under the lease, believes that the existing lease terms are as favorable to the Company as would be available from an unaffiliated party.

CODE OF ETHICS

The Company has adopted a Code of Ethics (as such term is defined in Item 406 of Regulation S-K). The Code of Ethics is available on the Company's website at www.enzo.com, and in print to any shareholder that requests it by contacting Investor Relations at (212) 583-0100. The Code of Ethics applies to the Company's employees, officers and members of the Board. The Code of Ethics has been designed to deter wrongdoing and to promote:

- (1) Honest and ethical conduct, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships;

- (2) Full, fair, accurate, timely, and understandable disclosure in reports and documents that the Company files with, or submits to, the Securities and Exchange Commission and in other public communications made by the Company;
- (3) Compliance with applicable governmental laws, rules and regulations;
- (4) The prompt internal reporting or violations of the Code of Ethics to an appropriate person or persons identified in the Code of Ethics; and
- (5) Accountability for adherence to the Code of Ethics.

COMPENSATION OF DIRECTORS

Each person who serves as a Director and who is not otherwise an officer or an employee (such Director being classified as an “Outside Director”) of the Company receives an annual Director’s fee of \$30,000. The Lead Independent Director receives an additional annual Director’s fee of \$25,000. Each Outside Director who serves on a Board committee other than as a committee chair also receives an annual fee of \$7,500. The Chairman of the Audit Committee receives an additional annual fee of \$20,000 and the Chairman of the Compensation Committee and the Chairman of the Nominating/Governance Committee each receive an additional annual fee of \$10,000. The Outside Directors receive either stock options or restricted stock units following the Annual Meeting, provided such person is a Director of the Company at such time. The number of stock options or restricted stock units that the Outside Directors will be granted will be equivalent to 25,000 restricted stock units, not to exceed a fair market value of \$100,000 per year. Either the stock options or restricted stock units referred to above shall be subject to a two-year vesting period; provided that at the time any non-employee Director ceases to be a Director of the Company (other than due to such Director’s resignation), such non-employee Director’s restricted stock units shall become fully vested at such time. The equity instruments are granted at the market price on the date of grant and have a term of up ten (10) years. The Company reimburses Directors for their travel and related expenses in connection with attending meetings of the Board and Board-related activities.

Director Compensation Table

The following table sets forth the information concerning compensation earned during our fiscal year ended July 31, 2014 by all non-employee Directors:

| Name | Fees Earned or Paid in Cash | Stock Option Awards (1) | Change in Pension Value and Non-Qualified Deferred Compensation Earnings | All Other Compensation | Total |
|---|-----------------------------------|-------------------------------|--|---------------------------|------------|
| Barnard Kasten, M.D. <i>Director</i> | \$ 109,375 | \$ 67,243 | — | — | \$ 176,618 |
| Gregory M. Bortz <i>Director</i> | \$ 72,500 | \$ 67,243 | — | — | \$ 139,743 |
| Dov Perlysky <i>Director</i> | \$ 62,500 | \$ 67,243 | — | — | \$ 129,743 |

- (1) Represents the grant fair value on the respective grant date for the fiscal year ended July 31, 2014, in accordance with accounting authoritative guidance. The assumptions used in calculating these amounts are set forth in Notes 1 and 10 to the Company’s financial statements for the fiscal year ended July 31, 2014, included in the Company’s Form 10-K filed with the SEC on October 9, 2014.

COMPENSATION OF EXECUTIVE OFFICERS

Compensation Discussion and Analysis

The Compensation Committee of our Board oversees our executive compensation program. In this role, the Compensation Committee reviews and approves all compensation decisions relating to our Named Executive Officers. The Compensation Committee also reviews and approves all equity awards for all employees except for annual amounts pre-approved for granting by the Chief Executive Officer or President primarily for non-officers or new employees in connection with employment offers.

The Company strives to apply a uniform philosophy to compensation for all of its employees. This philosophy is based on the premise that the achievements of the Company result from the combined and coordinated efforts of all employees working toward common objectives.

Say-on-Pay Feedback from Stockholders

In 2011, we submitted our executive compensation program to an advisory vote of our stockholders and it was approved at our 2011 annual meeting of stockholders. In addition, at our 2011 annual meeting of stockholders, a majority of our stockholders who voted supported an annual vote on our executive compensation and, in response, our Compensation Committee determined to hold an annual advisory vote on the matter. Annually, our Compensation Committee intends to review the results of the advisory vote and will consider this feedback as it completes its annual review of each pay element.

At our 2013 Annual Meeting of Stockholders, approximately 62% of the shares that were voted were cast in favor of our say-on-pay proposal. During 2014, the Compensation Committee directed our senior management team to continue to engage and gather feedback from our major stockholders regarding our executive compensation programs to better understand our stockholders' views on executive compensation, be responsive to our stockholders' views and meaningfully address any concerns they had. Our outreach program during 2014 included the following:

- multiple in-depth discussions and dialog throughout the year between senior management and institutional stockholders,
- examination of reports and analysis issued by principal proxy advisory firms,
- analysis of compensation practices at peer companies; and
- solicitation of advice from the Compensation Committee's independent compensation consultant.

In fiscal year 2014, we reported solid financial performance over the prior year, with a nearly 166% improvement in total shareholder return to 120%. Non-GAAP earnings per share increased by 43% in fiscal 2014 when compared to fiscal 2013. As a result, our Compensation Committee did not make any changes to our executive compensation program. The Compensation Committee will continue to consider our stockholders' views when making future decisions regarding the structure and implementation of our executive compensation programs.

Objectives and Philosophy of Our Executive Compensation Program

The primary objectives of the Compensation Committee with respect to executive compensation are to:

- ensure that executive compensation is aligned with our corporate business objectives and performance;
- promote the achievement of key strategic and financial performance objectives by linking cash and equity incentives;
- align executives' incentives with the creation of long-term stockholder value; and
- align executive compensation with comparable companies in our industry sectors to attract, retain and motivate the best possible executive talent.

We may also award long term incentive compensation in the form of restricted stock awards or stock options that vest over time. We believe this practice helps to retain our executives and aligns their interests with those of our stockholders by allowing them to participate in the longer term success of our Company as reflected in stock price appreciation. We may issue restricted stock awards in the future and believe that the use of time-vested restricted stock minimizes the likelihood of risky behavior and risky decision making that would be influenced by opportunities for short-term gains.

To achieve these objectives, the Compensation Committee evaluates senior management with input from our CEO, with the goal of setting compensation at levels the Compensation Committee believes are competitive with those of other companies in our industry that compete with us for executive talent. The Compensation Committee also conducts an annual evaluation of the CEO in addition to senior management evaluations. As part of these evaluations, our Compensation Committee considers key financial, strategic and operational objectives, including but not limited to: award of new patents, intellectual property protection, advancement of strategic alliances, collaborations, M&A activity, licensing, clinical trial progress, new product introductions, provider contracts, investor relations, corporate governance, and our financial and operational performance, as quantified by measures at the consolidated level and for each of the operating segments.

In making compensation decisions, the Compensation Committee compares our executive compensation against a peer group of publicly traded companies which they believe have business life cycles, revenues, market capitalizations, products, research and development investment levels and/or number/capabilities of employees that are roughly comparable to ours and against which the Compensation Committee believes we compete for executive talent. The Compensation Committee has retained Arthur Gallagher & Company, Human Resources & Compensation Consulting (formerly James F. Reda & Associates) ("Consultant") as an independent compensation consultant. The Company's senior management, with the assistance of the Consultant, compiled a list of peer companies. Since 2005, the Consultant has analyzed the executive compensation programs of these companies and issued reports to the Compensation Committee, the latest in November 2011. For fiscal 2014, since the Compensation Committee intended to keep compensation at or near the prior year levels, which have been below past market estimates, the Consultant indicated to the Compensation Committee that the previous market review could be used to ensure compensation is not excessive and within market range. The Consultant, with recommendations from senior management previously modified the peer company list to better reflect changes at the Company, with respect to operating segment significance, changes within the industries that the Company operates and changes among companies included in the peer group.

The companies that were included in the most recent peer group are as follows:

- Affymetrix, Inc.
- Alkermes, Inc.
- Amylin Pharmaceuticals (acquired by Bristol-Myers Squibb in 2012)
- Bio-Reference Laboratories, Inc.
- Cepheid, Inc.
- Cryolife, Inc.
- Gen Probe, Inc.
- Genomic Health, Inc.
- Incyte Corp.
- Intermune, Inc.
- Isis Pharmaceuticals, Inc.
- Lexicon Pharmaceuticals, Inc.
- Meridian Biosciences, Inc.
- Myraid Genetics, Inc.

- PDL Bio Pharma, Inc.
- Progenics Pharmaceuticals Inc.
- United Therapeutics Corporation
- Vertex Pharmaceuticals Inc.

We compete with many other companies for executive personnel. The Compensation Committee generally targets total compensation for executives at the 50th percentile of total compensation paid to similarly situated executives of the companies in the peer group.

The Compensation Committee may adjust compensation levels, upon consideration of the relevant drivers relating to the life sciences, clinical diagnostics or therapeutics industries we operate in, with respect to an executive's individual experience and performance level, and the overall performance of the Company.

The Compensation Committee met once in fiscal 2014 in order to review and approve our compensation for named executives and non-employee Directors, and approve equity awards for all employees. The results of the Compensation Committee activities were reported to the Board.

Components of our Executive Compensation Program

The primary elements of our executive compensation program are:

- base salary;
- equity awards;
- non-equity incentive plan compensation;
- benefits and other compensation; and
- severance and change in control benefits.

Base Salary

Base salary levels recognize the experience, skills, knowledge and responsibilities of each executive's position within the Company.

Exclusive of the base salaries that are contractual, base salaries are reviewed annually by the Compensation Committee, and may be adjusted from time to time to realign salaries with market levels and among our peer group after taking into account individual responsibilities, performance, experience and cost of living. Base salaries also may be increased for merit reasons, based on the executive's success in meeting or exceeding individual performance objectives, promoting our core values and demonstrating leadership abilities.

The base salaries of the two founders, Dr. Elazar Rabbani, our Chairman of the Board, Chief Executive Officer, Secretary and Director and Mr. Barry Weiner, our President, Chief Financial Officer, Principal Accounting Officer, Treasurer and Director are set in accordance with the terms of executed employment agreements with each individual. Pursuant to the terms of their respective employment agreements, Dr. Rabbani and Mr. Weiner are currently at a base annual salary of \$555,475 and \$492,708, respectively. Current base salaries remain unchanged since January 2012.

Non-Equity Incentive Compensation

In November 2010, the Compensation Committee agreed to recommend to the Board that it adopt a “Pay for Performance” Plan (the “Plan”) for the Named Executive Officers and key management personnel to align incentive pay with performance as set forth with the individual based on their role with the Company. Such Plan was adopted for the Named Executive Officers effective January 1, 2011 and as of August 1, 2011 for other key management personnel. The performance goals for the Named Executive Officers and the annual performance awards are determined and approved by the Compensation Committee annually. The Plan provides for performance measures based on financial and non-financial measures and rewards for achievement either for targets attained or improvements realized.

The weights on financial performance measures vary for Corporate and Divisional officers from 30% to 60% and include trade and service revenue growth, planned improvement in margins (divisional only), profitability and cash flows, with adjustments for non-recurring, uncontrollable events impacting revenues, expenses or cash flow beyond the control of management and certain legal expenses over the prior fiscal year. The Compensation Committee chose these measures for fiscal 2013 and 2014 because they believe they are aligned with our core operating performance for fiscal 2013 and 2014 which focused on the business improvement over the prior year.

The weights on non-financial performance measures are between 40% and 70% and include strategic, operational and individual goals. Strategic and operational measures for fiscal 2014, depending on whether a Corporate or Divisional Named Executive Officer, include among others, implementation of cost reductions, process and infrastructure improvements, business and technology advancement, advancement of partnering arrangements and litigation proceedings, customer satisfaction, quality assurance and employee satisfaction. Individual performance measures which ranged from 10% to 30% of target goals include communication, leadership and process improvement. The measures provide for Threshold, Target and Maximum awards and are based on various ranges of performance. All Plan awards are approved by the Compensation Committee with the non-financial awards being more subjective.

The corporate financial measures applicable to the Chief Executive Officer, President, Senior VP Finance and VP Corporate Development, inclusive of adjustments, include revenue, operating loss improvement, and cash flow from operations improvement, which are equally weighted and averaged for the finals results. Equally weighted measures for the division heads are division-level revenue, gross margin, operating loss improvement, and cash flow improvement. The measures used for fiscal 2014 and corresponding payouts are as follows:

| (in thousands) | <u>Threshold</u> | <u>Target</u> | <u>Maximum</u> | <u>Achieved</u> |
|--|------------------|---------------|----------------|-----------------|
| Financial Performance Measures—Revenue | | | | |
| Corporate Revenues—trade and service | \$ 86.7 | \$ 96.3 | \$ 106.0 | \$ 95.9 |
| Payout—Revenue | 50% | 100% | 150% | |
| Financial Performance Measures—Profit & Cash Flow | | | | |
| Corporate operating loss improvement | \$ 0.8 | \$ 1.0 | \$ 1.1 | \$ 4.9 |
| Corporate cash flow from operations improvements | \$ 3.0 | \$ 3.7 | \$ 4.1 | \$ 6.3 |
| Payout—Profits & Cash Flow | 0% | 100% | 150% | |

No Clinical Lab division executives were Named Executive Officers in fiscal 2014 or 2013 under the Plan. No Life Science division executives were Named Executive Officers in fiscal 2014.

In connection with the Plan, Dr. Rabbani was eligible for a maximum bonus of 75% of base salary for the fiscal year ended July 31, 2014. Dr. Rabbani was above threshold performance for his financial goals and at target performance for his non-financial goals and was awarded a bonus of \$375,000, which represented 68% of his base pay. In reviewing the CEO's accomplishments, the Compensation Committee recognized Dr. Rabbani's broad contributions in the areas of his role as Chairman of the Board, oversight of and increases to our technology platform and scientific product development, recruitment of new members of executive and scientific management, setting strategy for business development, implementing process improvement directly impacting financial performance and integration and realignment of our operating sites and oversight and protection of intellectual property, including outstanding patent litigation matters. In fiscal 2014, the CEO's efforts contributed to the favorable results in a patent litigation case and the advancement of other outstanding patent litigation matters.

In connection with the Plan, Mr. Weiner was eligible for a maximum bonus of 60% of base salary for the fiscal year ended July 31, 2014 under the Plan. Mr. Weiner was above threshold performance for his three financial goals and at target performance for his non-financial goals and was awarded a bonus of \$265,000 which represented 54% of his base pay. The Compensation Committee recognized Mr. Weiner's contributions in strategic planning, financial management, including our Company's financial position and liquidity, corporate governance, communication efforts with our stockholders, investors and outside analysts, managing relationships with investment bankers for equity raise opportunities, oversight of the finance group and compliance with the Company's Section 404 Sarbanes Oxley requirements, role in recruitment of new management personnel and divisional management, leadership role among the divisional executives, execution of a planned cost reduction across all operating units, assistance with patent litigation cases and the successful financing transactions in fiscal 2014.

In connection with the Plan, Mr. James M. O'Brien was eligible for a maximum bonus of 30% of base salary under the Plan. The Compensation Committee reviewed the recommendation from our CEO with respect to Mr. James O'Brien's performance in meeting the non-financial objectives including, enhancing our financial reporting internally and to the Board and the Audit Committee, participation in and achievements in the project to reduce operating and corporate costs, including third party contracts insurance program, benefit plans and professional fees, monitoring internal controls and Section 404 Sarbanes Oxley requirements, recruiting staff to the finance group and leadership role among our finance group and specifically in 2014 directly managed financing and equity activities. Mr. James M. O'Brien was above threshold performance for his three financial goals and exceeded threshold performance for his three non-financial goals and was awarded a bonus of \$37,000, which represented 30% of his base pay.

In connection with the Plan, Mr. Goldberg was eligible for a maximum bonus of 35% of base salary under the Plan. The Compensation Committee reviewed the recommendation from our CEO with respect to Mr. Goldberg's performance in meeting non-financial objectives including, expand our corporate development and relations with industry leaders and investment bankers, integral role in the cost reduction program, direct execution of plan to integrate cross functional personnel and product development within operating units, prepare strategic business plan for molecular diagnostics, expanding tests in strategic areas and improving efficiencies through greater automation. Mr. Goldberg fell below the threshold performance for non-financial goals thus was awarded a bonus of \$20,000, which represented 9% of his base pay.

Stock Options and Restricted Stock Awards

At its sole discretion, the Compensation Committee awards either stock options or restricted stock as the primary vehicle for long-term incentives to our executives, including our Named Executive Officers. Prior to fiscal 2013 we had not issued any stock options to any employees, including the Named Executive Officers, since 2005.

We believe that equity awards provide our executives with a strong link to our long-term performance, create an ownership culture, and help to align the interests of our Named Executive Officers and our shareholders. Equity awards are intended as both a reward for contributing to the long-term success of our Company and an incentive for future performance.

Equity awards, in the form of stock options, restricted stock and/or restricted stock units vest ratably over a two or three year period with 50% or 33% of the award vesting 12 months after the Named Executive Officer's start date or the annual anniversary of the award grant and the remainder of the awards vesting annually over the remaining period. The vesting feature of our equity grants is intended to further our goal of executive retention by providing an incentive to our Named Executive Officers to remain in our employ during the vesting period.

For fiscal year 2014, the Compensation Committee decided to grant stock options instead of restricted stock unit awards to focus management on improving shareholder value.

In determining the size of equity awards to our Named Executive Officers, our Compensation Committee considers comparable equity awards of executives in our compensation peer group, our Company-level operating and stock performance, the applicable Named Executive Officer's performance, the amount of equity previously awarded to the executive, the vesting schedule of such previous awards and the recommendations of management and its independent Consultant to the Compensation Committee. For the fiscal years ended July 31, 2014, 2013 and 2012, average equity compensation as a percentage of total compensation for all Named Executive Officers was 5%, 10% and 8%, respectively.

Equity awards of stock options or restricted stock are discretionary, and may be granted annually in conjunction with the review of a Named Executive Officer's individual performance. The Compensation Committee reviews all components of the Named Executive Officer's compensation, including the allocation between cash and equity, when determining annual equity awards to ensure that a Named Executive Officer's total compensation conforms to our overall philosophy and objectives.

In January 2014, the Named Executive Officers were issued stock options as a component of their total compensation package as follows:

| Executive Officer | Stock Options Issued | Market Value at Time of Issuance |
|--------------------------|-----------------------------|---|
| Elazar Rabbani, Ph. D | 41,634 | \$ 43,549 |
| Barry W. Weiner | 33,305 | \$ 34,837 |
| James M. O'Brien (1) | 20,000 | \$ 22,140 |
| David C. Goldberg | 29,455 | \$ 32,342 |
| Andrew P. Whiteley (2) | 12,273 | \$ 13,476 |
| Andrew R. Crescenzo (2) | 29,455 | \$ 32,342 |

(1) New hire grant issued on February 3, 2014.

(2) Employment ended during fiscal year 2014.

The Compensation Committee has a policy not to approve annual equity awards to any employees, including Named Executive Officers, at a time when our Company is in possession of material non-public information. We do not engage in timing of any equity awards to Named Executive Officers in coordination with the release of material non-public information.

Tax Deductibility

Section 162(m) of the Internal Revenue Code (the "Code") places a limit of \$1,000,000 on the amount of compensation that we may deduct in any given year with respect to the CEO and certain of our other most highly paid executive officers. There is an exception to the \$1,000,000 limitation for performance-based compensation meeting certain requirements.

Our annual base salary, a portion of cash incentive compensation and time-based restricted stock units are generally subject to the Section 162(m) deduction limitations. For 2014 all direct compensation is expected to be tax deductible. To maintain flexibility in compensating executive officers in view of the overall objectives of our compensation program, the Compensation Committee has not adopted a policy requiring that all compensation be tax deductible.

Risk Considerations in Our Compensation Program

We do not believe our compensation policies and practices encourage or support excessive risk taking by our executive officers or key managers. We establish compensation practices that we believe provide an appropriate level of incentive based compensation, in combination with non-incentive based compensation, to encourage our executive officers and key managers to act in the long-term best interests of the Company and our stockholders. These practices include:

- Awarding annual incentive bonuses based on assessment of short-term performance against financial and non-financial measures;
- Benchmarking annual incentive bonuses against an appropriate peer group of companies;
- Providing the Compensation Committee with discretion in approving annual non-equity incentive awards, with respect to non-financial targets, which affords the committee the opportunity to reduce payments if it determines excessive risk was taken to achieve bonus targets; and
- Granting time-vested equity that generally vests over a two to three year period which provides incentives for our executive officers to act in the long-term best interests of the Company.

Summary Compensation Table

The following table sets forth summary information concerning compensation awarded to, paid to or earned by each of the following persons: (i) our Chairman of the Board, Chief Executive Officer and Secretary, (ii) our President, Chief Financial Officer, Principal Accounting Officer and Treasurer, (iii) each of our three most highly compensated executive officers (the "Named Executive Officers"), and (iv) two former employees for all services rendered to the Company during each of the fiscal years ended July 31, 2014, 2013 and 2012.

| Name and Principal Position | Year | Salary (1) | Stock Awards (2) | Option Awards (2) | Non-Equity Incentive Plan Compensation (3) | All Other Compensation (4) | Total |
|--|------|------------|------------------|-------------------|--|----------------------------|--------------|
| Elazar Rabbani, Ph.D. <i>Chairman of the Board of Directors, Chief Executive Officer and Secretary</i> | 2014 | \$ 555,478 | — | \$ 43,549 | \$ 375,000 | \$ 156,000 | \$ 1,130,027 |
| | 2013 | \$ 555,475 | — | \$ 46,591 | \$ 245,000 | \$ 156,000 | \$ 1,003,066 |
| | 2012 | \$ 555,475 | \$ 39,830 | — | \$ 375,000 | \$ 167,887 | \$ 1,138,192 |
| Barry W. Weiner <i>President, Chief Financial Officer, Principal Accounting Officer, Treasurer and Director</i> | 2014 | \$ 492,708 | — | \$ 34,837 | \$ 265,000 | \$ 153,233 | \$ 945,778 |
| | 2013 | \$ 492,708 | — | \$ 37,301 | \$ 173,250 | \$ 154,567 | \$ 857,826 |
| | 2012 | \$ 492,708 | \$ 31,862 | — | \$ 265,000 | \$ 154,195 | \$ 943,765 |
| James M. O'Brien (5) <i>Senior Vice President of Finance</i> | 2014 | \$ 123,846 | — | \$ 22,140 | \$ 37,000 | \$ 4,388 | \$ 187,374 |
| David C. Goldberg <i>Vice President Corporate Development and Interim General Manager, Enzo Clinical Labs</i> | 2014 | \$ 215,000 | — | \$ 32,342 | \$ 20,000 | \$ 29,460 | \$ 296,802 |
| | 2013 | \$ 215,000 | — | \$ 34,423 | \$ 65,500 | \$ 29,183 | \$ 344,106 |
| | 2012 | \$ 208,076 | \$ 24,600 | — | \$ 70,000 | \$ 27,711 | \$ 330,387 |
| Andrew P. Whiteley (6) <i>Chief Operating Officer, Enzo Life Sciences</i> | 2014 | \$ 190,867 | — | \$ 13,476 | — | \$ 18,796 | \$ 223,139 |
| | 2013 | \$ 226,000 | — | \$ 14,343 | \$ 37,500 | \$ 19,876 | \$ 297,719 |
| | 2012 | \$ 220,000 | \$ 12,300 | — | \$ 40,000 | \$ 17,097 | \$ 289,397 |
| Andrew R. Crescenzo (6) <i>Senior Vice President of Finance</i> | 2014 | \$ 193,423 | — | \$ 32,342 | — | \$ 17,931 | \$ 243,696 |
| | 2013 | \$ 235,000 | — | \$ 34,423 | \$ 56,000 | \$ 20,058 | \$ 345,481 |
| | 2012 | \$ 235,000 | \$ 29,520 | — | \$ 60,000 | \$ 19,834 | \$ 344,354 |

- (1) Base salaries set as of January 1 each year.
- (2) Represents the grant fair value on the respective grant dates for the fiscal years ended July 31, 2014, 2013 and 2012, in accordance with accounting authoritative guidance. The assumptions used in calculating the amounts are set forth in Notes 1 and 10 to the Company's Financial Statements for the three years ended July 31, included in the Company's Form 10-K filed with the SEC on October 9, 2014.
- (3) Represents awards accrued under the Pay for Performance Plan for the years ended July 31, 2014, 2013 and 2012. The Compensation Committee approved a recommendation from the Chief Executive Officer and President to pay out 30% of each of the Chairman's and President's 2013 Incentive Plan award in stock options, the above chart only reflects the amount to be paid in cash and excludes \$105,000 and \$74,500, respectively that will be reflected as a stock option grant in fiscal 2014 for 2013.
- (4) See the "All Other Compensation" chart for additional information
- (5) Named Executive Officer on February 3, 2014.
- (6) Employment ended during fiscal year 2014.

Grants of Equity Awards in Fiscal 2014

During the fiscal year ended July 31, 2014, the Compensation Committee approved the following equity awards to the Named Executive Officers:

| | | Estimated Future Payouts | | | Estimated Future Payouts Under | | | All Other stock | All Other Option | Exercise or | Grant Date |
|-------------------------|------------|--|--------|---------|--------------------------------|--------|-----------|-----------------|------------------|---------------|------------|
| | | Under Non-Equity Incentive Plan Awards | | | Equity Incentive Plan Awards | | | Awards: | Awards: | Base Price of | Fair Value |
| | | Threshold | Target | Maximum | Threshold | Target | Maximum | Number of | Number of | Option Awards | of Stock |
| Name | Grant Date | | | | | | Shares of | Securities | (S/Sh) | and Option | |
| | | | | | | | Stock or | Underlying | | Awards | |
| | | | | | | | Units | Options | | | |
| Elazar Rabbani, Ph.D | 1/17/2014 | | | | | | | 41,634 | \$ 2.70 | \$ 43,549 | |
| Barry W. Weiner | 1/17/2014 | | | | | | | 33,305 | \$ 2.70 | \$ 34,837 | |
| James M. O'Brien | 2/3/2014 | | | | | | | 20,000 | \$ 2.75 | \$ 22,140 | |
| David C. Goldberg | 1/17/2014 | | | | | | | 29,455 | \$ 2.70 | \$ 32,342 | |
| Andrew P. Whiteley (1) | 1/17/2014 | | | | | | | 12,273 | \$ 2.70 | \$ 13,476 | |
| Andrew R. Crescenzo (1) | 1/17/2014 | | | | | | | 29,455 | \$ 2.70 | \$ 32,342 | |

(1) Employment ended during fiscal year 2014.

Outstanding Equity Awards at Fiscal Year End—July 31, 2014

The following table sets forth summary information regarding the outstanding equity awards made to the Named Executive Officers at July 31, 2014:

| Name | Number of Securities Underlying Unexercised Options Exercisable | Number of Securities Underlying Unexercised Options Unexercisable | Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options | Option Exercise Price | Option Expiration Date | Number of Shares or Units of Stock That Have Not Vested | Market Value of Shares or Units of Stock That Have Not Vested (1) | Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested | Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested |
|------------------------------|---|---|--|-----------------------|------------------------|---|---|---|---|
| Elazar Rabbani, Ph.D | 50,000 | — | | \$ 17.66 | 1/21/2015 | — | — | | |
| | | 38,505 | | \$ 2.88 | 1/17/2018 | 19,253 | \$ 92,414 | | |
| | | 41,634 | | \$ 2.70 | 1/17/2019 | 41,634 | \$ 199,843 | | |
| Barry W. Weiner | 50,000 | — | | \$ 17.66 | 1/21/2015 | — | — | | |
| | | 30,802 | | \$ 2.88 | 1/17/2018 | 15,401 | \$ 73,925 | | |
| | | 33,305 | | \$ 2.70 | 1/17/2019 | 33,305 | \$ 159,864 | | |
| James M. O'Brien | | 20,000 | | \$ 2.75 | 2/3/2019 | 20,000 | \$ 96,000 | | |
| David C. Goldberg | 10,000 | — | | \$ 17.66 | 1/21/2015 | — | — | | |
| | | 27,429 | | \$ 2.88 | 1/17/2018 | 18,295 | \$ 87,816 | | |
| | | 29,455 | | \$ 2.70 | 1/17/2019 | 29,455 | \$ 141,384 | | |
| Andrew P. Whiteley (2) | | 11,429 | | \$ 2.88 | 1/17/2018 | — | — | | |
| | | 12,273 | | \$ 2.70 | 1/17/2019 | — | — | | |
| Andrew R. Crescenzo, CPA (3) | | 27,429 | | \$ 2.88 | 1/17/2018 | — | — | | |
| | | 29,455 | | \$ 2.70 | 1/17/2019 | — | — | | |

(1) Market value is determined by multiplying the number of shares by the closing price market price of Enzo Biochem, Inc. at July 31, 2014.

(2) Employment ended during fiscal year 2014, all unvested options were cancelled.

(3) Employment ended during fiscal year 2014, vesting restriction of equity was removed.

Options Exercised and Stock Vested

The following table sets forth the options exercised by and stock vested for the Named Executive Officers during the fiscal year ended July 31, 2014.

| Name | Option Awards | | Stock Awards | |
|----------------------|---------------------------------------|--------------------------------|--------------------------------------|-------------------------------|
| | Number of Shares Acquired On Exercise | Value Realized On Exercise (1) | Number Of Shares Acquired On Vesting | Value Realized On Vesting (1) |
| Elazar Rabbani, Ph.D | | | 8,096 | \$ 22,182 |
| Barry W. Weiner | | | 6,476 | \$ 17,744 |
| James M. O'Brien | | | — | — |
| David C. Goldberg | | | 3,333 | \$ 9,132 |
| Andrew P. Whiteley | | | 1,667 | \$ 4,567 |
| Andrew R. Crescenzo | | | 4,000 | \$ 10,960 |

(1) The value realized is the closing market price on the day the stock awards vest, multiplied by the total number of shares vesting.

Employment Agreements

Mr. Barry Weiner and Dr. Elazar Rabbani (each the "Executive") are parties to employment agreements with the Company, effective May 4, 1994, as subsequently amended (the "Employment Agreements"). Each Executive also receives a non-equity incentive plan bonus, the amount of which shall be determined by the Compensation Committee and/or the Board of Directors based on approved financial and non-financial objectives. Each Employment Agreement provides that, in the event of termination of employment by the Executive for "good reason," or a termination of employment by the Company without "cause", change in control or nonrenewal, as such terms are defined in the Employment Agreement, each Executive shall be entitled to receive: (i) a lump sum in an amount equal to three years of the Executive's base annual salary; (ii) a lump sum in an amount equal to the annual bonus paid by the Company to the Executive for the last fiscal year of the Company ending prior to the date of termination multiplied by three; (iii) insurance coverage for the Executive and his dependents, at the same level and at the same charges to the Executive as immediately prior to his termination, for a period of three (3) years following his termination from the Company; (iv) all accrued obligations, as defined therein; and (v) with respect to each incentive pay plan (other than stock option or other equity plans) of the Company in which the Executive participated at the time of termination, an amount equal to the amount the Executive would have earned if he had continued employment for three additional years. If the Executive is terminated by reason of his disability, he shall be entitled to receive, for three years after such termination, his base annual salary less any amounts received under a long term disability plan. If the Executive's employment with the Company is terminated by reason of his death, his legal representatives shall receive the balance of any remuneration due him under the terms of his Employment Agreement. The Employment Agreements currently expire on September 30, 2015, but will automatically renew for successive two year periods unless notice is given to the Company within 180 days of the end of such successive term.

Messrs. James M. O'Brien and David C. Goldberg are "at will" employees and are parties to certain change in control provisions with the Company which is deemed customary practice for their respective positions, as more fully discussed below. Mr. James M. O'Brien is a party to a severance arrangement from his initial employment arrangement.

Benefits and All Other Compensation

We maintain broad-based benefits that are provided to all employees, including health and dental insurance, group life insurance and a 401(k) plan. Named Executive Officers are eligible to participate in our employee benefit plans. The annual Company match for our Named Executive Officers and our employees is up to \$11,500, if over 50 years old, or limited to 50% of the maximum contribution by the Named Executive Officers.

Certain of our Named Executive Officers may be entitled to benefits that are not otherwise available to all of our employees, including supplemental health, life insurance and disability benefits. We do not provide post-retirement health coverage to our Named Executive Officers or our employees. Our health and insurance plans are substantially the same among all management levels at the Company. Dr. Rabbani and Mr. Weiner are provided life insurance benefits in connection with their total compensation arrangements. The contractual arrangement of \$90,000 each for Dr. Rabbani and Mr. Weiner is included as "Life Insurance" in the "All Other Compensation" chart below.

In particular circumstances, we may provide relocation allowances when executives first join us. The purpose of this program is to attract talented executives outside our geographic area. Certain named executives are provided use of a Company owned vehicle for business and personal use or provided a car allowance.

All Other Compensation

The following table contains information regarding each component of "All Other Compensation" in the Summary Compensation Table to the Named Executive Officers for the fiscal years ended July 31, 2014, 2013 and 2012.

| Name | Year | 401(K) (1) | Life Insurance (2) (3) | Medical and Disability Insurance (4) | Personal Use of Auto (5) | Relocation | Total All Other Compensation |
|-------------------------|------|---------------|------------------------------|---|--------------------------------|------------|---------------------------------|
| Elazar Rabbani, Ph.D | 2014 | \$ 11,500 | \$ 123,760 | \$ 8,084 | \$ 12,656 | — | \$ 156,000 |
| | 2013 | \$ 11,000 | \$ 126,573 | \$ 9,434 | \$ 20,880 | — | \$ 167,887 |
| | 2012 | \$ 11,000 | \$ 126,808 | \$ 14,465 | \$ 20,880 | — | \$ 173,153 |
| Barry W. Weiner | 2014 | \$ 11,500 | \$ 118,100 | \$ 2,333 | \$ 21,300 | — | \$ 153,233 |
| | 2013 | \$ 11,250 | \$ 119,684 | \$ 2,333 | \$ 21,300 | — | \$ 154,567 |
| | 2012 | \$ 11,000 | \$ 119,562 | \$ 2,333 | \$ 21,300 | — | \$ 154,195 |
| James M. O' Brien | 2014 | — | \$ 138 | — | \$ 4,250 | — | \$ 4,388 |
| David C. Goldberg | 2014 | \$ 9,825 | \$ 1,032 | — | \$ 18,603 | — | \$ 29,460 |
| | 2013 | \$ 9,616 | \$ 1,032 | — | \$ 18,535 | — | \$ 29,183 |
| | 2012 | \$ 8,550 | \$ 787 | — | \$ 18,374 | — | \$ 27,711 |
| Andrew P. Whiteley (6) | 2014 | \$ 11,462 | \$ 834 | — | \$ 6,500 | — | \$ 18,796 |
| | 2013 | \$ 11,247 | \$ 829 | — | \$ 7,800 | — | \$ 19,876 |
| | 2012 | \$ 8,787 | \$ 510 | — | \$ 7,800 | — | \$ 17,097 |
| Andrew R. Crescenzo (6) | 2014 | \$ 11,247 | \$ 834 | — | \$ 5,850 | — | \$ 17,931 |
| | 2013 | \$ 11,224 | \$ 1,034 | — | \$ 7,800 | — | \$ 20,058 |
| | 2012 | \$ 11,000 | \$ 1,034 | — | \$ 7,800 | — | \$ 19,834 |

- (1) Represents Company match under our 401(k) plan.
- (2) Represents premiums of term policies of which the Named Executive Officers or other party is the beneficiary.
- (3) Includes the contractual payment for life insurance reimbursement for Dr. Rabbani and Mr. Weiner of \$90,000 each.
- (4) Represents incremental medical and disability benefits costs.
- (5) Represents the personal use of Company-provided auto or car allowance.

(6) Employment ended during fiscal year 2014.

Severance and Change in Control Benefits

Pursuant to Employment Agreements/Arrangements entered into with Dr. Rabbani and Messrs. Barry Weiner, James O'Brien and David Goldberg, these executives are entitled to specified benefits in the event of the termination of their employment under specified circumstances, including termination following a change of ownership or control of our Company. We have provided more information about these benefits, along with estimates of their value under various circumstances within the below table.

Based on market trends, we believe these benefits help us compete for executive talent. We believe our severance and change in control benefits are in line with severance packages offered to executives by the companies identified in our peer group.

Our practice in the case of change in control benefits has been structured to trigger only in the event of a termination of the executive without cause or by the executive for good reason during a specified period before or after the change in control.

Potential Payments upon Termination or Change in Control

The following table contains information regarding each component of Potential Payments upon Termination or Change in Control Compensation Table to the Named Executive Officers as of July 31, 2014.

| Name and Principal Position | Acceleration of Vesting | Severance Pay (1) | Continuation of Benefits | Tax Gross-Up | Total |
|---|-------------------------|-------------------|--------------------------|--------------|--------------|
| Elazar Rabbani, Ph.D. | | | | | |
| Termination without cause or by Executive for Good Reason | \$ 161,361 | \$ 2,401,434 | \$ 629,798 | — | \$ 3,192,593 |
| Change in control transaction without termination | — | — | — | — | — |
| Change in control transaction with termination | \$ 161,361 | \$ 2,401,434 | \$ 629,798 | \$ 1,173,416 | \$ 4,366,009 |
| Barry W. Weiner | | | | | |
| Termination without cause or by Executive for Good Reason | \$ 129,080 | \$ 1,997,874 | \$ 612,818 | — | \$ 2,739,772 |
| Change in control transaction without termination | — | — | — | — | — |
| Change in control transaction with termination | \$ 129,080 | \$ 1,997,874 | \$ 612,818 | \$ 1,031,524 | \$ 3,771,296 |
| James M. O'Brien | | | | | |
| Termination without cause or by Executive for Good Reason | — | \$ 140,000 | — | — | \$ 140,000 |
| Change in control transaction without termination | — | — | — | — | — |
| Change in control transaction with termination | \$ 41,000 | \$ 140,000 | — | — | \$ 181,000 |
| David C. Goldberg | | | | | |
| Termination without cause or by Executive for Good Reason | — | — | — | — | — |
| Change in control transaction without termination | — | — | — | — | — |
| Change in control transaction with termination | \$ 130,519 | — | — | — | \$ 130,519 |

(1) The amounts listed in this column do not include accrued amounts such as accrued salary or vacation.

Benefits to Certain Former Executive Officers upon Termination of Employment

Mr. Crescenzo in connection with his end of employment effective May 2, 2014 received benefits pursuant to his employment arrangement. Mr. Crescenzo received \$80,933 for severance, \$4,519 for accrued unused vacation and \$8,117 for payment of COBRA premiums. Mr. Crescenzo received all these amounts during fiscal year 2014. In addition, vesting restriction of his equity was removed.

Mr. Whiteley in connection with his end of employment effective May 1, 2014 received benefits pursuant to his employment arrangement. Mr. Whiteley received \$113,300 for severance, \$8,715 for accrued unused vacation and \$6,088 for payment of COBRA premiums. Mr. Whiteley received \$43,577 of this amount during fiscal year 2014 and will receive the remaining balance during fiscal year 2015.

Tax and Accounting Considerations

Federal tax laws impose requirements in order for compensation payable to the CEO and certain executive officers to be fully deductible. The Company believes it has taken appropriate actions to maximize its income tax deduction. IRC Section 162(m) generally precludes a public corporation from taking a deduction for compensation in excess of \$1,000,000 for its CEO or any of its three other highest-paid executive officers (other than the CEO or Chief Financial Officer), unless certain specific and detailed criteria are satisfied.

Annually, the Company reviews all compensation programs and payments to determine the tax impact on the Company as well as on the executive officers. In addition, the Company reviews the impact of its programs against other considerations, such as accounting impact, stockholder alignment, market competitiveness, effectiveness and perceived value to employees. Because many different factors influence a well-rounded, comprehensive executive compensation program, some compensation may not be deductible under IRC Section 162(m). The Company will continue to monitor developments and assess alternatives for preserving the deductibility of compensation payments and benefits to the extent reasonably practicable, consistent with its compensation policies and as determined to be in the best interests of the Company and its stockholders.

COMPENSATION COMMITTEE REPORT

The Compensation Committee has reviewed and discussed the Compensation Discussion and Analysis in this proxy report with management. Based on its review and discussion with management, the Compensation Committee recommended to our Board of Directors that the Compensation Discussion and Analysis be included in this proxy statement and also be incorporated by reference in our Annual Report on Form 10-K for the fiscal year ended July 31, 2014.

Submitted by members of the Compensation Committee on November 24, 2014
Dr. Bernard L. Kasten, Chairman
Gregory M. Bortz
Dov Perlysky

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

No member of the Compensation Committee has a relationship that would constitute an interlocking relationship with the Company's executive officers or other Directors.

SECURITIES AUTHORIZED FOR ISSUANCE UNDER EQUITY COMPENSATION PLANS

The following table sets forth information regarding our existing equity compensation plans as of July 31, 2014:

| Plan Category | Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (A) | Weighted Average Exercise Price of Outstanding Options, Warrants and Rights | Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (A)) (2) |
|--|---|---|---|
| Equity compensation plans approved by security holders | 1,198,412(1) | \$ 5.06 | 1,656,000 |
| Equity compensation plans not approved by security holders | — | — | — |
| Total | 1,198,412 | \$ 5.06 | 1,656,000 |

(1) Shares to be issued upon exercise of options or restricted stock awards under the 1999, 2005 and 2011 plans.

(2) Shares available for grant under the 2011 plan.

INSURANCE FOR INDEMNIFICATION OF DIRECTORS AND OFFICERS

The Company has in effect with Illinois National Insurance Company and Allied World Assurance Company, under a policy effective February 22, 2014 and expiring on February 22, 2015, insurance covering all of its Directors and officers and certain other employees of the Company against certain liabilities and reimbursing the Company for obligations which it incurs as a result of its indemnification of such directors, officers and employees. Such insurance has been obtained in accordance with the provisions of Section 726 of the Business Corporation Law of the State of New York. The annual premium is \$204,063.

This report has been provided by the Board of Directors of the Company.

Elazar Rabbani, Ph.D.
 Barry W. Weiner
 Gregory M. Bortz
 Dr. Bernard L. Kasten
 Dov Perlysky

PROPOSAL 2
ADVISORY VOTE ON THE COMPANY'S NAMED EXECUTIVE
OFFICER COMPENSATION

The Exchange Act, and more specifically, Section 14A of the Exchange Act which was added under the Dodd-Frank Wall Street Reform and Consumer Protection Act, enacted in July 2010, requires that we provide stockholders with the opportunity to vote to approve, on a nonbinding advisory basis, the compensation of our Named Executive Officers as disclosed in this Proxy Statement in accordance with the SEC's rules (commonly referred to as "Say-on-Pay").

At our 2011 annual meeting of stockholders, a majority of our stockholders who voted supported an annual vote on our executive compensation and, in response, our Compensation Committee determined to hold an annual vote on the matter.

Our compensation program for Named Executive Officers is intended to link compensation to performance; to provide competitive compensation levels to attract retain and reward executives; and to align management's interests with those of our clients and stockholders. The compensation provided to the Named Executive Officers is dependent on the Company's financial, operational and strategic performance, and the Named Executive Officer's individual performance, and is intended to drive creation of long-term shareholder value.

We encourage stockholders to read the "Compensation Discussion and Analysis" section of this Proxy Statement, the 2014 Summary Compensation Table and the other related tables and disclosure for a detailed description of the fiscal year 2014 compensation of our Named Executive Officers. The Compensation Committee and the Board believe that the policies and procedures articulated in the "Compensation Discussion and Analysis" are effective in achieving our goals and that the compensation of our Named Executive Officers reported in this Proxy Statement appropriately reflects our results during the fiscal year.

The vote on this resolution is not intended to address any specific element of compensation; rather, the advisory vote relates to the overall compensation of our Named Executive Officers. This vote is advisory, which means that it is not binding on the Company, the Board or the Compensation Committee of the Board. However, we value the opinion of our stockholders and the Board and the Compensation Committee will review the voting results and will take into account the outcome of the vote when considering future compensation decisions for the Named Executive Officers.

Accordingly, we ask our stockholders to vote on the following resolution:

"RESOLVED, that the Company's stockholders approve, on a nonbinding advisory basis, the compensation paid to the Company's Named Executive Officers, as disclosed in the Company's Proxy Statement for the 2014 Annual Meeting of Stockholders pursuant to the compensation disclosure rules of the Securities and Exchange Commission, including the Compensation Discussion and Analysis, the Summary Compensation table and the related compensation tables and narrative discussion."

THE BOARD OF DIRECTORS OF THE COMPANY UNANIMOUSLY RECOMMENDS THAT YOU VOTE "FOR" APPROVING THE NAMED EXECUTIVE OFFICER COMPENSATION AS DISCLOSED IN THIS PROXY STATEMENT PURSUANT TO THE COMPENSATION DISCLOSURE RULES OF THE SEC.

PROPOSAL 3
RATIFICATION OF APPOINTMENT OF INDEPENDENT REGISTERED PUBLIC
ACCOUNTING FIRM

The Audit Committee of the Board has selected and the Board has appointed EisnerAmper LLP (“EisnerAmper”), an independent registered public accounting firm, to audit the financial statements of Enzo Biochem, Inc. for the fiscal year ending July 31, 2015. The Company is submitting its selection of EisnerAmper for ratification by the stockholders at the Annual Meeting. A representative of EisnerAmper, who is expected to be present at the Annual Meeting, will have the opportunity to make a statement and is expected to be available to respond to appropriate questions. EisnerAmper has served as our independent registered public accounting firm since April 19, 2013. Prior to such time, Ernst and Young LLP (“E&Y”) served as our independent registered public accounting firm. The Company does not expect that a representative from E&Y will be present at the Annual Meeting.

Although the selection and appointment of independent registered public accounting firm is not required to be submitted to a vote of shareholders, the Board deems it desirable to obtain the shareholders’ ratification and approval of this appointment.

Principal Accountant Fees and Services

During the fiscal years ended July 31, 2014 and 2013, respectively, fees for services provided by the Company’s independent registered public accounting firms were as follows:

EisnerAmper, the Company’s current independent registered public accounting firm, billed the Company for services for fiscal 2014 and 2013, as follows. The fees listed are aggregate fees for services performed for the year, regardless of when the fee was actually billed.

| | FY 2014 | FY 2013 |
|---------------------|----------------|----------------|
| Audit Fees: | \$ 503,500 | \$ 483,000 |
| Audit-related Fees: | 60,000 | — |
| Tax Fees: | — | — |
| All Other Fees: | 67,500 | 34,000 |
| Total | \$ 631,000 | \$ 517,000 |

Audit Fees - Consists of fees for professional services necessary to perform an audit or review in accordance with the Public Company Accounting Oversight Board, including services rendered for the audit of our annual financial statements (including services incurred with rendering an opinion under Section 404 of the Sarbanes-Oxley Act of 2002) and quarterly reviews of the Company’s interim financial statements.

Audit-Related Fees - During fiscal year 2014, there were a total of \$60,000 audit related fees associated with comfort letters. There were no audit-related fees during the year ended July 31, 2013.

Tax Fees - EisnerAmper performed no tax compliance services during fiscal 2014 or 2013.

All Other Fees - During fiscal 2014 and 2013, EisnerAmper performed certain Audit services for an employee benefit plan for the years ended December 31, 2013 and 2012, in which the Company is the plan sponsor; these fees were \$35,000 and \$34,000 respectively. In addition, during fiscal year 2014, EisnerAmper performed a review of registration statements related to issuance of equity with total fees of \$32,500.

Pre-Approval Policies and Procedures - The Audit Committee has adopted a policy that requires advance approval of all audit, audit-related, tax services, and other services performed by the independent registered public accounting firm. The policy provides for pre-approval by the Audit Committee of specifically defined audit and non-audit services. Unless the specific service has been previously pre-approved with respect to that year, the Audit Committee must approve the permitted service before the independent auditor is engaged to perform it. The Audit Committee has delegated to the Chair of the Audit Committee authority to approve permitted services provided that the Chair reports any decisions to the Audit Committee at its next scheduled meeting.

E&Y, the Company's former independent registered public accounting firm, billed the Company for services for fiscal 2014 and 2013, as follows. The fees listed are aggregate fees for services performed for the aforementioned periods, regardless of when the fee was actually billed.

| | 2014 | 2013 |
|---------------------|------------|------------|
| Audit Fees: | — | \$ 377,000 |
| Audit-related Fees: | \$ 190,000 | — |
| Tax Fees: | — | 10,000 |
| All Other Fees: | — | — |
| Total | \$ 190,000 | \$ 387,000 |

Audit Fees - Consists of fees for professional services necessary to perform an audit or review in accordance with the Public Company Accounting Oversight Board, including services rendered for the audit of our annual financial statements (including services incurred with rendering an opinion under Section 404 of the Sarbanes-Oxley Act of 2002) and quarterly reviews of the Company's interim financial statements.

Audit-Related Fees - During fiscal year 2014, there were a total of \$190,000 audit related fees associated with comfort letters. There were no audit-related fees during the year ended July 31, 2013.

Tax Fees - During fiscal 2013, E&Y performed certain tax compliance services.

All Other Fees - There were no professional services rendered by E&Y that would be classified as other fees during the years ended July 31, 2014 and 2013.

In making its recommendation to ratify the appointment of EisnerAmper LLP as the Company's independent registered public accounting firm for the fiscal year ending July 31, 2015, the Audit Committee has considered whether the services provided by EisnerAmper are compatible with maintaining the independence of EisnerAmper.

THE BOARD OF DIRECTORS OF THE COMPANY UNANIMOUSLY RECOMMENDS A VOTE "FOR" PROPOSAL 3 RELATING TO THE RATIFICATION OF THE COMPANY'S APPOINTMENT OF EISNERAMPER LLP TO SERVE AS THE COMPANY'S INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FOR THE FISCAL YEAR ENDING JULY 31, 2015.

OTHER MATTERS

Except as discussed in this Proxy Statement, the Board does not know of any matters that are to be properly presented at the Annual Meeting other than those stated in the Notice of 2014 Annual Meeting of Shareholders and referred to in this Proxy Statement.

If other matters properly come before the Annual Meeting, it is the intention of the persons named in the enclosed proxy card to vote thereon in accordance with their best judgment. Moreover, the Board reserves the right to adjourn or postpone the Annual Meeting for failure to obtain a quorum, for legitimate scheduling purposes or based on other circumstances that, in the Board's belief, would cause such adjournments or postponements to be in the best interests of all Enzo shareholders.

METHOD AND COST OF SOLICITATION OF PROXIES

The Company will bear the cost of preparing, assembling and mailing the Proxy Statement, the enclosed proxy card and other material which may be sent to the shareholders in connection with this solicitation. In addition to the solicitation of proxies by use of the mails, officers and regular employees may solicit the return of proxies. The Company may reimburse persons holding stock in their names or in the names of other nominees for their expense in sending proxies and proxy material to principals.

ANNUAL REPORT

The Notice that you received in the mail contains instructions on how to access both the Company's 2014 Annual Report to Shareholders, which includes the Company's Annual Report on Form 10-K for its fiscal year ended July 31, 2014 and this Proxy Statement.

The Company will provide, without charge to each person being solicited by this Proxy Statement, upon request, a copy of its 2014 Annual Report to Shareholders, which includes the Company's Annual Report on Form 10-K for its fiscal year ended July 31, 2014. Upon payment of a reasonable fee, shareholders may also obtain a copy of the exhibits to our Annual Report on Form 10-K for our fiscal year ended July 31, 2014. All such requests should be directed to Barry W. Weiner, President, Enzo Biochem, Inc., 527 Madison Avenue, New York, New York 10022.

ENZO WEBSITE

In addition to the information about the Company and its subsidiaries contained in this Proxy Statement, additional information about the Company can be found on our website located at www.enzo.com, including information about our management team, products and services and our corporate governance practices.

The corporate governance information on our website includes the Company's Corporate Governance Guidelines, the Code of Conduct and the charters of each of the committees of the Board. These documents can be accessed at www.enzo.com. Printed versions of our Corporate Governance Guidelines, our Code of Conduct and the charters for our Board committees can be obtained, free of charge, by writing to the Company at: 527 Madison Avenue, New York, New York 10022, Attn: President.

This information about Enzo's website and its content, together with other references to the website made in this Proxy Statement, is for information only and the content of the Company's website is not deemed to be incorporated by reference in this Proxy Statement or otherwise filed with the Securities and Exchange Commission.

SHAREHOLDER PROPOSALS

Shareholder Proposals

Proposals of shareholders intended to be included in the Company's Proxy Statement and form of proxy for use in connection with the Company's 2015 Annual Shareholder Meeting must be received by the Company's Secretary at the Company's principal executive offices at 527 Madison Avenue, New York, New York 10022, no later than August 6, 2015 (120 calendar days preceding the one-year anniversary of the date this Proxy Statement was first mailed to our shareholders for the 2014 Annual Shareholder Meeting), and must otherwise satisfy the procedures prescribed by Rule 14a-8 under the Exchange Act. It is suggested that any such proposals be submitted by certified mail, return receipt requested.

Pursuant to Rule 14a-4 under the Exchange Act, shareholder proxies obtained by our Board in connection with our 2014 Annual Shareholder Meeting will confer on the proxies and attorneys-in-fact named therein discretionary authority to vote on any matters presented at the annual meeting which were not included in the Company's Proxy Statement in connection with such annual meeting, unless notice of the matter to be presented at the annual meeting is provided to the Company's Secretary before October 21, 2015 (the 45th day preceding the one-year anniversary of the date this Proxy Statement was first mailed to our shareholders for the 2014 Annual Shareholder Meeting).

Director Nominations

Under our Bylaws, shareholders intending to nominate one or more candidates for election to our Board at our 2015 Annual Shareholder Meeting may do so only if written notice of the intent to make such nomination(s) has been given, either by personal delivery or by United States mail, postage prepaid, to the Secretary of the Company, at the Company's principal executive offices at 527 Madison Avenue, New York, New York 10022, not less than ninety (90) days nor more than one hundred twenty (120) days prior to the earlier of the date of such annual meeting or January 17, 2015. Such notice must contain all of the information required by our Bylaws, including, without limitation, all information that would be required in connection with such nomination(s) under the Securities and Exchange Commission's proxy rules if such nomination were the subject of a proxy solicitation and the written consent of each nominee for election to our Board named therein to serve if elected. The chairman of the meeting may refuse to acknowledge the nomination of any person not made in compliance with our Bylaws.

If you have any questions or require any assistance with voting your shares, please contact Investor Relations at (212) 583-0100.

By Order of the Board of Directors

Barry W. Weiner,
President, Chief Financial Officer,
Principal Accounting Officer, Treasurer and Director
Dated: November 24, 2014

TO VOTE, MARK BLOCKS BELOW IN BLUE OR BLACK INK AS FOLLOWS:

VOTE BY INTERNET - www.proxyvote.com

KEEP THIS PORTION FOR YOUR RECORDS
DETACH AND RETURN THIS PORTION ONLY

**ENZO BIOCHEM, INC.
10 EXECUTIVE BLVD.
FARMINGDALE, NY 11735**

**THIS
PROXY
CARD
IS
VALID
ONLY
WHEN**

Use the Internet to transmit your voting instructions and for electronic delivery of information up until 11:59 P.M. Eastern Time the day before the cut-off date or meeting date. Have your proxy card in hand when you access the web site and follow the instructions to obtain your records and to create an electronic voting instruction form.

ELECTRONIC DELIVERY OF FUTURE PROXY MATERIALS

If you would like to reduce the costs incurred by our company in mailing proxy materials, you can consent to receiving all future proxy statements, proxy cards and annual reports electronically via e-mail or the Internet. To sign up for electronic delivery, please follow the instructions above to vote using the Internet and, when prompted, indicate that you agree to receive or access proxy materials electronically in future years.

SIGNED AND DATED.

ENZO BIOCHEM, INC.

The Board of Directors recommends you vote FOR the following:

1. Election of Director

For All Withhold All For All Except

Nominee:

01) Elazar Rabbani, Ph.D.

To withhold authority to vote for any individual nominee(s), mark "For All Except" and write the number(s) of the nominee(s) on the line below.

VOTE BY PHONE - 1-800-690-6903

Use any touch-tone telephone to transmit your voting instructions up until 11:59 P.M. Eastern Time the day before the cut-off date or meeting date. Have your proxy card in hand when you call and then follow the instructions.

VOTE BY MAIL

Mark, sign and date your proxy card and return it in the postage-paid envelope we have provided or return it to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717.

The Board of Directors recommends you vote FOR Proposals 2 and 3:

2. To approve, in a non-binding advisory vote, the compensation of the Company's named executive officers.

For Against Abstain

3. To ratify the appointment of EisnerAmper LLP as the Company's independent registered public accounting firm for the Company's fiscal year ending July 31, 2015.

NOTE: In their discretion, the Proxies are authorized to vote upon such other business as may properly come before the Annual Meeting. This proxy when properly executed will be voted in the manner directed herein by the undersigned shareholder. **If no direction is made, this proxy will be voted FOR the election of the nominee for Class III Director named in Proposal 1 in this proxy card, and FOR each of Proposals 2 and 3 in this proxy card.**

For address changes and/or comments, please check this box and write them on the back where indicated.

Please sign exactly as your name(s) appear(s) hereon. When signing as attorney, executor, administrator, or other fiduciary, please give full title as such. Joint owners should each sign personally. All holders must sign. If a corporation or partnership, please sign in full corporate or partnership name by authorized officer.

Signature [PLEASE SIGN WITHIN BOX] Date

Signature (Joint Owners) Date

**PROXY
ENZO BIOCHEM, INC.
527 MADISON AVENUE
NEW YORK, NEW YORK 10022**

THIS PROXY IS SOLICITED ON BEHALF OF THE BOARD OF DIRECTORS

The undersigned hereby appoints Mr. Barry Weiner and Dr. Bernard Kasten as Proxies, each with the power to appoint his substitute, and hereby authorizes them to represent and to vote, as designated on the reverse side, all the shares of the Common Stock of Enzo Biochem, Inc. held of record by the undersigned on November 24, 2014 at the Annual Meeting of Shareholders to be held on January 21, 2015 or at any adjournment or postponement thereof.

The shares represented by this proxy, when properly executed and returned, will be voted as directed herein. **IF THIS PROXY IS DULY EXECUTED AND RETURNED, AND NO VOTING DIRECTIONS ARE GIVEN HEREIN, SUCH SHARES WILL BE VOTED "FOR" ELECTION OF THE NOMINEE FOR CLASS III DIRECTOR NAMED IN PROPOSAL 1 IN THIS PROXY CARD, AND "FOR" EACH OF PROPOSALS 2 AND 3 IN THIS PROXY CARD.** The undersigned hereby acknowledges receipt of notice of, and the proxy statement for, the aforesaid Annual Meeting of Shareholders.

Address Changes/Comments: _____

(If you noted any Address Changes/Comments above, please mark corresponding box on the reverse side.)

Continued and to be signed on reverse side