

SCHEDULE 14A
(RULE 14a-101)

INFORMATION REQUIRED IN PROXY STATEMENT
SCHEDULE 14A INFORMATION
Proxy Statement Pursuant to Section 14(a) of the Securities
Exchange Act of 1934

Filed by the Registrant [X]
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))
- [X] Definitive Proxy Statement
 [] Definitive Additional Materials
 [] Soliciting Material Pursuant to Rule 14a-12

ENZO BIOCHEM, INC.

(Name of Registrant as Specified in Its Charter)

N/A

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

Payment of Filing Fee (Check the appropriate box):

- [X] No fee required.
 [] Fee computed on table below per Exchange Act Rules 14a-6(i) (4) and 0-11.

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

(2) Aggregate number of securities to which transaction applies:

(3) Per unit price or other underlying value of transaction computed pursuant to Exchange Act Rule 0-11 (set forth the amount on which the filing fee is calculated and state how it was determined):

(4) Proposed maximum aggregate value of transaction:

(5) Total fee paid:

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[] Check box if any part of the fee is offset as provided by Exchange Act Rule 0-11(a) (2) and identify the filing for which the offsetting fee was paid previously. Identify the previous filing by registration statement number, or the Form or Schedule and the date of its filing.

(1) Amount previously paid:

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

(3) Filing Party: Enzo Biochem, Inc.

ENZO BIOCHEM, INC.
60 EXECUTIVE BOULEVARD
FARMINGDALE, NEW YORK 11735
(631) 755-5500

NOTICE OF ANNUAL MEETING OF SHAREHOLDERS
TO BE HELD ON JANUARY 20, 2005

To the Shareholders of Enzo Biochem, Inc.:

NOTICE IS HEREBY GIVEN that the Annual Meeting of Shareholders of Enzo Biochem, Inc., a New York corporation (the "Company"), will be held at The Yale Club of New York, 50 Vanderbilt Avenue, Grand Ballroom, 20th Floor, New York, New York, on January 20, 2005, at 9:00 a.m. local time (the "Annual Meeting"), for the following purposes:

1. To elect Barry W. Weiner, John J. Delucca and Melvin F. Lazar as Class II Directors for a term of three (3) years or until their respective

successors are elected and qualified;

2. To consider and vote upon a proposal to approve and adopt our 2005 Equity Compensation Incentive Plan (which we refer to in the accompanying proxy statement as the "Equity Compensation Incentive Plan Proposal");
3. To ratify the appointment of Ernst & Young LLP as the independent auditors for the Company for the Company's fiscal year ending July 31, 2005; and
4. To transact such other business as may properly come before the Annual Meeting or any adjournment thereof.

The close of business on November 24, 2004 has been fixed as the record date for the determination of shareholders entitled to notice of and to vote at the Annual Meeting. The transfer books of the Company will not be closed.

All shareholders are cordially invited to attend the Annual Meeting. Please note that you will be asked to present 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 expect to attend, you are requested to sign, date and return the enclosed proxy promptly. Shareholders who execute proxies retain the right to revoke them at any time prior to the voting thereof by filing written notice of such revocation with the Secretary of the Company, by submission of a duly executed proxy bearing a later date or by voting in person at the Annual Meeting of Shareholders. 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., 60 Executive Boulevard, Farmingdale, New York 11735, Attention: Shahram K. Rabbani, Secretary. A return envelope which requires no postage if mailed in the United States is enclosed for your convenience.

By Order of the Board of Directors,

Shahram K. Rabbani, SECRETARY

Farmingdale, New York
November 26, 2004

ENZO BIOCHEM, INC.
60 EXECUTIVE BOULEVARD
FARMINGDALE, NEW YORK 11735
(631) 755-5500

PROXY STATEMENT

ANNUAL MEETING OF SHAREHOLDERS
TO BE HELD ON JANUARY 20, 2005

This Proxy Statement is furnished in connection with the solicitation, by the Board of Directors of Enzo Biochem, Inc., a New York corporation (the "Company"), of proxies in the enclosed form for the Annual Meeting of Shareholders to be held at The Yale Club of New York, 50 Vanderbilt Avenue, Grand Ballroom, 20th Floor, New York, New York, on January 20, 2005 at 9:00 a.m. local time (the "Annual Meeting"), and for any adjournment or adjournments thereof, for the purposes set forth in the preceding Notice of Annual Meeting of Shareholders. The form of proxy solicited by the Board of Directors affords stockholders the ability to specify a choice among approval of, disapproval of, or abstention with respect to, each matter acted upon at the Annual Meeting. 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 below and, in their best judgment, 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 filing written notice of such revocation with the Secretary of the Company, by submission of a duly executed proxy bearing a later date or by voting in person at the Annual Meeting. 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., 60 Executive Boulevard, Farmingdale, New York 11735, Attn.: Shahram K. Rabbani, Secretary. A return envelope which requires no postage if mailed in the United States is enclosed for your convenience.

The expense of the solicitation of proxies for the meeting, including the cost of mailing, will be borne by the Company. In addition to mailing copies of the enclosed proxy materials to stockholders, the Company may request persons,

and reimburse them for their expenses with respect thereto, who hold stock in their names or custody or in the names of nominees for others, to forward copies of such materials to those persons for whom they hold stock of the Company and to request authority for the execution of the proxies. In addition to the solicitation of proxies by mail, it is expected that some of the officers, directors and regular employees of the Company, without additional compensation, may solicit proxies on behalf of the Board of Directors by telephone, telefax, and personal interview.

The principal executive offices of the Company are located at 60 Executive Boulevard, Farmingdale, New York 11735. The approximate date on which this Proxy Statement and the accompanying form of proxy will first be sent or given to the Company's shareholders is November 26, 2004.

VOTING SECURITIES

Only holders of shares of common stock, par value \$.01 per share (the "Common Stock"), of the Company of record as of the close of business on November 24, 2004 are entitled to vote at the Annual Meeting (the "Record Date"). On the Record Date there were issued and outstanding 32,395,401 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. The holders of a majority of the outstanding shares of Common Stock as of the Record Date shall constitute a quorum.

The election of a nominee for director requires a plurality (i.e., an excess of votes over those cast for an opposing candidate) in the event that more than one candidate is running for a vacancy. An affirmative vote of the majority of the votes cast is required for approval of Proposal 2, Proposal 3 and all other matters submitted to the shareholders at the Annual Meeting. Abstentions and broker non-votes are not counted as votes cast on any matter to which they relate and will have no effect on the outcome of the vote. A broker non-vote occurs when a broker or other nominee does not have discretionary authority and has not received instructions with respect to a particular proposal. Proxy ballots are received and tabulated by the Company's transfer agent and certified by the inspector of election.

STOCK OWNERSHIP OF PRINCIPAL SHAREHOLDERS 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 under "Compensation of Directors and Executive Officers," all directors, and all 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 the Record Date. 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)
<S>	<C>	<C>
Elazar Rabbani, Ph.D.	2,064,792 (3)	6.373%
Shahram K. Rabbani	1,995,537 (4)	6.16%
Barry W. Weiner	1,249,775 (5)	3.858%
Dean Engelhardt, Ph.D.	235,724 (6)	*
Norman E. Kelker, Ph.D.	142,979 (7)	*
John J. Delucca	47,339 (8)	*
Irwin C. Gerson	30,181 (9)	*
Melvin F. Lazar, CPA	45,019 (10)	*
John B. Sias	168,281 (11)	*
Marcus Conant, M.D.	9,550 (12)	*
J. Morton Davis	3,045,656 (13)	9.5%
Smith Barney Fund Management LLC, Citigroup Global Markets Holdings, Inc.	3,878,274 (14)	12.1%
All directors and executive officers as a group (13 persons) (15)	6,276,384 (16)	18.74%

* 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., 60 Executive Boulevard, Farmingdale, New York 11735.
- (2) Based upon 32,395,401 shares of Common Stock of the Company outstanding as of the close of business on the Record Date.
- (3) Includes (i) 357,203 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof, (ii) 3,469 shares of Common Stock held in the name of Dr. Rabbani as custodian for certain of his children and (iii) 2,168 shares of Common Stock held in the name of Dr. Rabbani's wife as custodian for certain of their children. Does not include 183,143 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof. Includes 3,141 shares of Common Stock held in the Company's 401(k) plan.
- (4) Includes (i) 357,203 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof, (ii) 644 shares of Common Stock held in the name of Mr. Rabbani's son and (iii) 1,754 shares of Common Stock that Mr. Rabbani holds as custodian for certain of his nephews. Does not include 183,143 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof. Includes 3,106 shares of Common Stock held in the Company's 401(k) plan.

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- (5) Includes (i) 357,203 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof and (ii) 3,642 shares of Common Stock which Mr. Weiner holds as custodian for certain of his children. Does not include 183,143 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof. Includes 3,148 shares of Common Stock held in the Company's 401(k) plan.
- (6) Includes 51,683 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 37,840 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof. Includes 3,128 shares of Common Stock held in the Company's 401(k) plan.
- (7) Includes 25,731 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 29,669 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof. Includes 3,057 shares of Common Stock held in the Company's 401(k) plan.
- (8) Includes 47,339 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 20,485 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof.
- (9) Includes 30,181 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 12,009 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof.
- (10) Does not include 7,875 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof. Includes 7,875 shares of Common Stock owned by Mr. Lazar's wife and 3,150 shares of Common Stock held in the name of a defined benefit plan for which Mr. Lazar is the sole trustee and beneficiary.
- (11) Includes 98,622 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 20,485 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof.
- (12) Includes 9,550 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 16,908 shares of Common Stock issuable upon the exercise of options which are not exercisable within 60 days from the date hereof.
- (13) Mr. Davis' address is D.H. Blair Investment Banking Corp., 44 Wall Street, New York, New York 10005. Includes (i) 38,545 owned directly by Mr. Davis, (ii) 1,427,681 shares of Common Stock owned by D.H. Blair Investment Banking Corp. of which Mr. Davis is the sole shareholder, (iii) 903,201 shares owned by Rosalind Davidowitz, Mr. Davis' wife, (iv) 663,496 shares of Common Stock owned by Engex, Inc., a close-end registered investment company of which Mr. Davis is the Chairman of the Board of Directors, and (v) 12,733 shares owned by an investment advisor whose principal is Mr.

Davis . This information is based solely on Amendment No. 3 to a Schedule 13G filed on February 11, 2004.

- (14) The address of Smith Barney is 333 West 34th Street, New York, NY 10036, and the address of Citigroup Inc. is 399 Park Avenue, New York, New York 10001, the address of Citigroup Global Holdings, Inc. is 388 Greenwich Street, New York, New York 10001. This information is based solely on Amendment No. 3 to Schedule 13G filed on August 31, 2004 and adjusted to reflect a 5% stock dividend paid on November 15, 2004.
- (15) The total number of directors and executive officers includes three (3) executive officers who were not named under "Compensation of Directors and Executive Officers."
- (16) Includes 1,460,138 shares of Common Stock issuable upon the exercise of options which are exercisable within 60 days from the date hereof. Does not include 773,666 shares of Common Stock issuable upon the exercise of options held by such individuals which are not exercisable within 60 days from the date hereof.

PROPOSAL 1
ELECTION OF DIRECTORS

The Company has three (3) staggered classes of Directors, each of which serves for a term of three (3) years. At the Annual Meeting, the Company's Class II Directors will be elected to hold office for a term of three (3) years or until their respective successors are elected and qualified. Unless otherwise instructed, the accompanying form of proxy will be voted for the election of the below-listed nominees all of whom currently serve as Class II Directors, to continue such service as Class II Directors. Management has no reason to believe that any of the nominees will not be a candidate or will be unable to serve as a director. However, in the event that the nominees should become unable or unwilling to serve as directors, the form of proxy will be voted for the election of such persons as shall be designated by the Class I and Class III Directors.

CLASS II DIRECTOR NOMINEES TO SERVE UNTIL
THE 2008 ANNUAL MEETING, IF ELECTED:

CLASS II: NEW TERM TO EXPIRE IN 2008

NAME - - - - -	AGE ---	YEAR FIRST BECAME A DIRECTOR -----
Barry W. Weiner	54	1977
John J. Delucca	61	1982
Melvin F. Lazar, CPA	65	2002

THE BOARD OF DIRECTORS OF THE COMPANY RECOMMENDS A VOTE "FOR" THE ELECTION OF THE ABOVE-NAMED NOMINEES. PROXIES SOLICITED BY THE BOARD OF DIRECTORS WILL BE SO VOTED UNLESS SHAREHOLDERS SPECIFY IN THEIR PROXIES A CONTRARY CHOICE.

DIRECTORS WHO ARE CONTINUING IN OFFICE:

CLASS I: TERM TO EXPIRE IN 2007

NAME - - - - -	AGE ---	YEAR FIRST BECAME A DIRECTOR -----
Shahram Rabbani	52	1976
Irwin C. Gerson	74	2001

CLASS III: TERM TO EXPIRE IN 2006

NAME - - - - -	AGE ---	YEAR FIRST BECAME A DIRECTOR -----
Elazar Rabbani, Ph.D.	60	1976
John B. Sias	77	1982
Marcus A. Conant, M.D.	69	2004

The directors and executive officers of the Company are identified in the table below. Each executive officer of the Company serves at the pleasure of the Board of Directors.

<TABLE>
<CAPTION>

NAME	AGE	YEAR BECAME A DIRECTOR OR EXECUTIVE OFFICER	POSITION
Elazar Rabbani, Ph.D.	60	1976	Chairman of the Board of Directors and Chief Executive Officer
Shahram K. Rabbani	52	1976	Chief Operating Officer, Treasurer, Secretary and Director
Barry W. Weiner	54	1977	President, Chief Financial Officer and Director
Dean Engelhardt, Ph.D.	64	1981	Executive Vice President
Norman E. Kelker, Ph.D.	65	1981	Senior Vice President
Herbert B. Bass	56	1995	Vice President of Finance
Barbara E. Thalenfeld, Ph.D.	64	1995	Vice President, Corporate Development
David C. Goldberg	47	1995	Vice President, Business Development
John J. Delucca	61	1982	Director
John B. Sias	77	1982	Director
Irwin C. Gerson	74	2001	Director
Melvin F. Lazar, CPA	65	2002	Director
Marcus A. Conant, M.D.	69	2004	Director

BIOGRAPHICAL INFORMATION REGARDING DIRECTORS AND EXECUTIVE OFFICERS

DR. ELAZAR RABBANI is one of Enzo Biochem's founders and has served as the Company's Chairman of the Board of Directors and Chief Executive Officer since its inception in 1976. 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.

SHAHRAM K. RABBANI is the Chief Operating Officer, Treasurer, Secretary and Director, is a founder and has been with the Company since its inception. He is also President of Enzo Clinical Labs. Mr. Rabbani serves on the New York State Clinical Laboratory Association, a professional board. Mr. Rabbani is a trustee of Adelphi University and serves as Chairman of its Audit Committee. He received a Bachelor of Arts Degree in Chemistry from Adelphi University, located in Long Island, New York.

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

DR. DEAN ENGELHARDT has been the Company's Executive Vice President, since July 2000. Since joining the Company in 1981, Dr. Engelhardt has held several other executive and scientific positions within Enzo Biochem. In addition, Dr. Engelhardt has authored many papers in the area of nucleic acid synthesis and protein production and has been a featured presenter at numerous scientific conferences and meetings. He holds a Ph.D. degree in Molecular Genetics from Rockefeller University.

DR. NORMAN E. KELKER is the Senior Vice President and has held this position since 1989. Before this, he was the Company's Vice President for Scientific Affairs. Dr. Kelker has authored numerous scientific papers and presentations in the biotechnology field. He is a member of American Society of

Microbiology and the American Association of the Advancement of Science. Dr. Kelker received his Ph.D. in Microbiology and Public Health from Michigan State University.

HERBERT B. BASS is the Company's Vice President of Finance for the Company and is also Senior Vice President of Enzo Clinical Labs. Before his promotion in 1989 to Vice President of Finance, Mr. Bass served as the Corporate Controller of the Company. Mr. Bass has been with the Company since 1986. From 1977 to 1986, Mr. Bass held various positions at Danziger and Friedman, Certified Public Accountants, the most recent of which was audit manager. For the preceding seven years, he held various positions at Berenson & Berenson, Certified Public Accountants. Mr. Bass received a Bachelor of Business Administration degree in Accounting from Bernard M. Baruch College, in New York City.

DR. BARBARA E. THALENFELD is the Vice President of Corporate Development for Enzo Biochem and Vice President of Clinical Affairs for Enzo Therapeutics and has been employed with the Company since 1982. Dr. Thalenfeld has authored over 20 scientific papers in the areas of molecular biology and genetics, and is a member of the American Society of Gene Therapy, the Drug Development Association and the Association of Clinical Research Professionals. Dr. Thalenfeld received her Ph.D. at the Institute of Microbiology at Hebrew University in Jerusalem and a Master of Science degree in Biochemistry from Yale University, and completed a Post Doctoral Fellowship in the Department of Biological Sciences at Columbia University.

DAVID C. GOLDBERG is the Vice President of Business Development for Enzo Biochem and Senior Vice President of Enzo Clinical Labs, has been employed with the company since 1985. He has held several 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 a Master of Science degree in Microbiology from Rutgers University and a Master of Business Administration in Finance from New York University.

JOHN B. SIAS has been a Director of the Company since January 1982. Mr. Sias was President and Chief Executive Officer of Chronicle Publishing Company from April 1993 to September 2000. From January 1986 until April 1993, Mr. Sias was President of ABC Network Division, Capital Cities/ABC, Inc. From 1977 until January 1986, he was the Executive Vice President, President of the Publishing Division (which includes Fairchild Publications) of Capital Cities Communications, Inc.

JOHN J. DELUCCA has been a Director of the Company since January 1982. From 2003 to 2004, Mr. Delucca was Executive Vice President and Chief Financial Officer of REL Consulting Group. Mr. Delucca had been the Chief Financial Officer & Executive Vice President, Finance & Administration of Coty, Inc., from January 1999 to January 2002. From October 1993 until January 1999, he was Senior Vice President and Treasurer of RJR Nabisco, Inc. From January 1992 until October 1993, he was managing director and Chief Financial Officer of Hascoe Associates, Inc. From October 1, 1990 to January 1992, he was President of The Lexington Group. From September 1989 until September 1990, he was Senior Vice President-Finance of the Trump Group. From May 1986 until August 1989, he was senior Vice President-Finance at International Controls Corp. From February 1985 until May 1986, he was a Vice President and Treasurer of Textron, Inc. Before that, he was a Vice President and Treasurer of the Avco Corporation, which was acquired by Textron.

IRWIN C. GERSON has been a Director of the Company since May 8, 2001. From 1995 until December 1998, Mr. Gerson served as Chairman of Lowe McAdams Healthcare and prior thereto had been, since 1986, Chairman and Chief Executive Officer of William Douglas McAdams, Inc., one of the largest advertising agencies in the U.S. specializing in pharmaceutical marketing and communications to healthcare professionals. In February 2000, he was inducted into the Medical Advertising Hall of Fame. Mr. Gerson has a Bachelor of Science in Pharmacy from Fordham University and an MBA from the NYU Graduate School of Business Administration. He is a director of Andrx Corporation, a NASDAQ listed company which specializes in proprietary drug delivery technologies. From 1990 to 1999, he was Chairman of the Council of Overseers of the Arnold and Marie Schwartz College of Pharmacy and has served as a trustee of The Albany College of Pharmacy and Long Island University.

MELVIN F. LAZAR, CPA (age 65) has been a Director of the Company since August 1, 2002. Mr. Lazar was a founding partner of the public accounting firm of Lazar, Levine & Felix (LLP) from 1969 until October 2002. Mr. Lazar and his firm served the business and legal communities for over 30 years. He is an expert on the topic of business valuations and merger and acquisition activities. Mr. Lazar is a board member and chairman of the audit committee of Arbor Realty Trust, Inc. (ABR:NYSE). Arbor is a real estate investment trust (REIT) formed to invest in real estate related bridge and mezzanine loans, preferred equity investments and other real estate related assets. Mr. Lazar is a board member and serves as the Chairman of the Audit Committee of privately owned Active Media Services, Inc., the largest corporate barter company in the nation. Mr. Lazar is also a board member and serves as the Chairman of the Audit Committee of Ceko Environmental Corp., which is a provider of innovative

solutions to industrial ventilating and air quality problems. Mr. Lazar holds a Bachelor of Business Administration degree from The City College of New York (Baruch College).

MARCUS A. CONANT, M.D. has been a Director of the Company since July 1, 2004. Dr. Conant, received his B.S. and M.D. degrees from Duke University. He was an exchange student at Hammersmith Hospital in London, England and held an Elective Fellowship in Biochemistry at the London Hospital. Dr. Conant has been the recipient of numerous awards, and has served as a member of or consultant to a broad array of scientific societies and associations, community organizations and government committees and has authored or co-authored more than 70 published papers. Dr. Conant is a Clinical Professor at the University of California San Francisco (UCSF) and has been on the faculty of UCSF since 1967. He currently serves as Chairman of the Board of the Conant Foundation, an HIV/AIDS education and research foundation based in San Francisco. Dr. Conant served as principal investigator for Enzo's Phase I clinical trial of its gene medicine for HIV-1 infection.

Dr. Elazar Rabbani and Shahram K. Rabbani are brothers and Barry W. Weiner is their brother-in-law.

CORPORATE GOVERNANCE

Our Board of Directors and management are committed to responsible corporate governance to ensure that the Company is managed for the long-term benefit of its stockholders. To that end, during the past year, as in prior years, the Board of Directors 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 New York Stock Exchange ("NYSE").

CORPORATE GOVERNANCE POLICIES AND PRACTICES

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

CORPORATE GOVERNANCE GUIDELINES - The Board of Directors 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 of Directors, director qualifications and selection process, director compensation, 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.

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.

BOARD COMMITTEE CHARTERS - Each of the Company's Audit, Compensation and Nominating/Governance Committees has written charters adopted by the Company's Board of Directors that establish practices and procedures for each committee in accordance with applicable corporate governance rules and regulations. The charters are available on the Company's website at www.enzo.com.

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DIRECTOR INDEPENDENCE

REQUIREMENTS - The Board of Directors believes that a substantial 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 New York Stock Exchange, 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:

- o The director was an employee of the Company.
- o An immediate family member of the director was an executive officer of the Company.
- o A director was affiliated with or employed by a present or former internal or external auditor of the Company.
- o 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.

- o A director, or an immediate family member of the director, received more than \$100,000 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).
- o 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.
- o 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.
- o 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.
- o 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 five percent (5%) of that organization's consolidated gross revenues.

The Board has reviewed all material transactions and relationships between 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 of Directors has affirmatively determined that all of the non-employee directors are independent.

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, stockholders, 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. The independent members of the Board review the Nominating/Governance Committee candidates and nominate candidates for election by the Company stockholders.

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 all 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.

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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 of Directors 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.

Upon the recommendation of the Committee, Dr. Marcus Conant was elected to the Board of Directors effective July 1, 2004. Dr. Conant was selected from a group of several candidates and he was identified as a candidate to the Committee by a non-management director. Dr. Conant was interviewed by the Chair of the Nominating/Governance Committee, the Chairman and CEO and several Committee members prior to his election.

BOARD COMMITTEES

All members of each of the Company's three standing committees - the 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 the Audit, Compensation and Nominating/Governance Committees periodically hold meetings of only the independent directors or Committee members without management present. The presiding director of the Executive Sessions is rotated among the independent, non-management directors.

BOARD ACCESS TO INDEPENDENT ADVISORS

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

SHAREHOLDER COMMUNICATIONS WITH BOARD OF DIRECTORS

DIRECT COMMUNICATIONS - Any stockholder desiring to communicate with the Board of Directors or with any director regarding the Company may write to the Board or the director, c/o Shahram K. Rabbani, Office of the Secretary, Enzo Biochem, Inc., 60 Executive Boulevard, Farmingdale, NY 11735. The Office of the Secretary will forward all such communications to the director(s). Shareholders may also submit an email by filling out the email form on the Company's website at www.enzo.com.

ANNUAL MEETING - The Company encourages its directors to attend the annual meeting of stockholders each year. Dr. Elazar Rabbani and Messrs. Melvin F. Lazar, Shahram K. Rabbani and Barry W. Weiner attended the Annual Meeting of Shareholders held in January 2004.

MEETINGS OF THE BOARD OF DIRECTORS AND ITS COMMITTEES

During the fiscal year ended July 31, 2004, there were 4 formal meetings of the Board of Directors, several actions by unanimous consent and several informal 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 four formal meetings and the Compensation Committee had one formal meeting in fiscal 2004. Each of the Committees also held additional informal meetings.

The Audit Committee was established by and among the Board of Directors 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, as amended. The Audit Committee is authorized to review proposals of the Company's auditors regarding annual audits, recommend the engagement

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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. Delucca, Gerson, Lazar and Sias, and Mr. Delucca is the Chairman. The Board of Directors has determined that each of the Audit Committee members are independent, as defined in the NYSE's listing standards and as defined in Item 7(d)(3)(iv) of Schedule 14A under the Securities and Exchange Act of 1934. The Board of Directors has further determined that Messrs. Delucca and Lazar are each "audit committee financial experts" as such term is defined under Item 401(h)(2) 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 Corporation, including to establish and at least annually review officers' salaries and levels of officers' participation in the benefit plans of the Corporation, (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 (v) exercise all other powers of the Board of Directors with respect to matters involving the compensation of employees and the employee benefits of the Corporation as shall be delegated by the Board of Directors to the Compensation Committee. The current members of the Compensation Committee are Messrs. Gerson, Delucca and Lazar and Mr. Gerson is the Chairman.

The Nominating/Governance Committee has the power to recommend to the Board of Directors prior to each annual meeting of the shareholders of the Corporation: (i) the appropriate size and composition of the Board of Directors; and (ii) nominees: (1) for election to the Board of Directors for whom the Corporation 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 of Directors other than the Nominating/Governance Committee. The Nominating/Governance Committee will consider nominations from the stockholders, provided that they are made in accordance with the Company's By-laws. The current members of the Nominating/Governance Committee are Messrs. Gerson, Delucca, Lazar and Sias and Mr. Sias is the Chairman.

AUDIT COMMITTEE REPORT

In connection with the preparation and filing of the Company's Annual Report on Form 10-K for the year ended July 31, 2004:

- (1) The Audit Committee reviewed and discussed the audited financial statements with management;
- (2) The Audit Committee discussed with the independent auditors matters required to be discussed under Statement on Auditing Standards No. 61, as may be modified or supplemented;
- (3) The Audit Committee reviewed the written disclosures and the letter from the independent auditors required by the Independence Standards Board Standard No. 1, as may be modified or supplemented, and discussed with the independent auditors any relationships that may impact their objectivity and independence and satisfied itself as to the auditors' independence;
- (4) The Audit Committee discussed with the Company's independent auditors the overall scope and plans for their audits. The Audit Committee met with the independent auditors, with and without management present, to discuss the results of their examinations, their evaluations of the Company's internal controls, and the overall quality of the Company's financial reporting. The Audit Committee held four formal meetings during the fiscal year ended July 31, 2004 and
- (5) Based on the review and discussions referred to above, the Audit Committee recommended to the Board of Directors that the audited financial statements of the Company be included in the 2004 Annual Report on Form 10-K.

Submitted by the members of the Audit Committee

John J. Delucca
Irwin C. Gerson
Melvin F. Lazar, CPA
John B. Sias

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SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Securities Exchange Act of 1934, as amended, 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. 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.

Based solely on the Company's review of such forms furnished to the Company and written representations from certain reporting persons, the Company believes that the Reporting Persons have complied with all applicable filing requirements except the Form 4s relating to the Automatic Director Options granted to each of the non-employee directors following the Company's Annual Meeting of Shareholders held in 2004 were filed late.

CERTAIN RELATIONSHIP AND RELATED TRANSACTIONS

Enzo Clinical Labs, Inc. ("Enzolabs"), 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 Rabbani and Barry Weiner and his wife, the officers and directors of Pari. The lease commenced on December 20, 1989 and terminates on November 30, 2004. Subsequent to the lease termination, the Company will lease the facility on a month to month basis consistent with the lease payments required immediately prior to its termination pending the negotiation and execution of a new lease, which terms will be subject to approval by a majority of the independent directors of the Company. During fiscal 2004, Enzolabs paid approximately \$1,370,800 (including \$148,900 in real estate taxes) to Pari with respect to such facility and future payments are subject to cost of living adjustments. The Company, which has guaranteed Enzolabs' 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

NAME	OPTION/SARS GRANTED (#)	EMPLOYEES IN FISCAL YEAR	BASE PRICE (\$ / SH)	EXPIRATION DATE	5% (\$)	10% (\$)
<S>	<C>	<C>	<C>	<C>	<C>	<C>
Elazar Rabbani, Ph.D., Chairman of the Board of Directors and Chief Executive Officer	78,750	18.360%	17.45	3/07/14	864,219	2,190,101
Shahram K. Rabbani, Chief Operating Officer, Treasurer, Secretary and Director	78,750	18.360%	17.45	3/07/14	864,219	2,190,101
Barry W. Weiner, President and Director	78,750	18.360%	17.45	3/07/14	864,219	2,190,101
Dean Engelhardt, Ph.D., Executive Vice President	15,750	3.672%	17.45	3/07/14	172,844	438,020
Norman Kelker, Ph.D., Senior Vice President	15,750	3.672%	17.45	3/07/14	172,844	438,020

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AGGREGATED OPTION/SAR EXERCISES IN LAST FISCAL YEAR AND FISCAL YEAR-END OPTION/SAR VALUES

The following table sets forth certain information with respect to stock option exercises by the Named Executive Officers during the fiscal year ended July 31, 2004 and the value of unexercised options held by them at fiscal year-end.

<TABLE>
<CAPTION>

NAME	SHARES		NUMBER OF SECURITIES UNDERLYING UNEXERCISED OPTIONS/SARS AT FISCAL YEAR-END (#)		VALUE OF UNEXERCISED IN-THE-MONEY OPTIONS/SARS AT FISCAL YEAR-END (\$) (1)	
	ACQUIRED ON EXERCISE (#)	VALUE REALIZED (\$)	EXERCISABLE	UNEXERCISABLE	EXERCISABLE	UNEXERCISABLE
<S>	<C>	<C>	<C>	<C>	<C>	<C>
Elazar Rabbani, Ph.D.	284,137	2,509,221	357,203	183,143	1,373,818	149,858
Shahram K. Rabbani	284,137	2,509,221	357,203	183,143	1,373,818	149,858
Barry W. Weiner	201,014	1,775,158	357,203	183,143	1,373,818	149,858
Dean Engelhardt, Ph.D.	13,400	149,812	51,683	37,840	237,190	27,672
Norman E. Kelker, Ph.D.	-0-	177,158	25,731	29,669	171,348	19,981

(1) Market value of the underlying securities at fiscal year end minus the exercise price paid in cash or stock.

EMPLOYMENT AGREEMENTS

Each of Mr. Barry Weiner, Mr. Shahram Rabbani and Dr. Elazar Rabbani (the "Executives") are parties to an employment agreement effective May 4, 1994 (the "Employment Agreement(s)") with the Company. Pursuant to the terms of their respective Employment Agreements, as amended, Messrs. Weiner and Rabbani and Dr. Rabbani are currently compensated for the calendar year 2004 at a base annual salary of \$434,700, \$398,500 and \$398,500, respectively. Each Executive will also receive an annual bonus, the amount of which shall be determined by the Board of Directors in its discretion. Each Employment Agreement provides that, in the event of termination of the Executive for good reason or without cause (or, additionally, in the case of Dr. Rabbani, a nonrenewal), as such terms are defined therein, each Executive shall be entitled to receive: (a) a lump sum in an amount equal to three (3) years of the Executive's base annual salary; (b) 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 (3); (c) 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; (d) all accrued obligations, as defined therein; and (e) 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 (3) additional years. If the Executive is terminated by reason of his disability, he shall be entitled to receive, for three (3) years after such termination, his

base annual salary less any amounts received under a long term disability plan. If the Executive is terminated by reason of his death, his legal representatives shall receive the balance of any remuneration due him. The term of each of the Executive's Employment Agreement, as amended, currently expires on May 4, 2006, which term automatically renews for successive two year periods if notice to the Company is not given by either party within 180 days of the end of such successive term.

COMPENSATION OF DIRECTORS

As of January 1, 2004, 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 \$20,000 and a fee of \$1,500 for each meeting attended in person or by telephone. In addition, as of March 10, 2004 each non-management Director who serves on a Committee of the Board of Directors will receive a fee of \$1,000 for each meeting of the Committee attended by telephone and the Chairman of each such Committee shall receive an additional \$500 for each meeting of such Committee attended. Furthermore, on the date persons are first elected to serve as Outside Directors of the Company's Board of Directors, such persons shall receive options ("Initial Director Options") to purchase 15,000 shares of Common Stock of the Company, and will automatically receive options ("Automatic Director Options" and together with the Initial Director Options, the "Director Options") to purchase 12,500 shares of the Company's Common Stock immediately following the date of each annual meeting of the Company's shareholders, PROVIDED, HOWEVER, that such persons did not receive Initial

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Director Options since the most recent grant of Automatic Director Options and continue to serve as directors of the Company's Board of Directors. The exercise price for each share subject to a Director Option shall be equal to the fair market value of the Company's Common Stock on the date of grant. Director Options shall become exercisable at the discretion of the Board of Directors, subject to acceleration in certain circumstances, and shall expire the earlier of ten (10) years after the date of grant or ninety (90) days after the termination of the director's service on the Board of Directors. On January 7, 2004, each of Messrs Delucca, Gerson, Lazar and Sias were issued options to purchase 7,875 shares (adjusted to reflect a 5% stock dividend) of Common Stock. On March 8, 2004 each of Dr. Rabbani and Messrs. Rabbani and Weiner were issued options to purchase 78,750 shares (adjusted to reflect a 5% stock dividend) of Common Stock. On July 1, 2004 Dr. Conant was granted an Initial Director Option to acquire 15,875 shares (adjusted to reflect a 5% stock dividend) of Common Stock.

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

The current members of the Compensation Committee are Messrs. Gerson, Delucca and Lazar. No member of the Compensation Committee has a relationship that would constitute an interlocking relationship with the Company's executive officers or other directors.

COMPENSATION COMMITTEE REPORT

The Company strives to apply a uniform philosophy to compensation for all of its employees, including the members of its senior management. 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 goals and objectives.

The goals of the Company's compensation program are to align remuneration with business objectives and performance, and to enable the Company to retain and competitively reward executive officers who contribute to the long-term success of the Company. The Company's compensation program for executive officers is based on the following principles, which are applicable to compensation decisions for all employees of the Company. The Company attempts to pay its executive officers competitively in order that it will be able to retain the most capable people in the industry. Information with respect to levels of compensation being paid by comparable companies is obtained from various publications and surveys.

During the last fiscal year, the compensation of executive officers consisted principally of salary and bonus and the Company granted stock options to certain of its executive officers, additional grants of which may be made in the future. The cash portion of such program includes base salary and annual bonuses, which are awarded in the discretion of the Board of Directors. Salary levels have been set based upon historical levels, amounts being paid by comparable companies and performance. The Company's equity-based compensation consists of the award of discretionary stock options, which are designed to provide additional incentives to executive officers to maximize shareholder value. Through the use of extended vesting periods, the option program is designed to encourage executive officers to remain in the employ of the Company. In addition, because the exercise prices of such options are typically set at or above the fair market value of the stock on the date the option is granted, executive officers can only benefit from such options if the trading price of

the Company's shares of Common Stock increases, thus aligning their financial interests directly with those of the shareholders.

In consideration for Dr. Elazar Rabbani's services as Chairman of the Board of Directors and Chief Executive Officer of the Company for the fiscal year ended July 31, 2004, the Company paid Dr. Rabbani an annual salary of \$430,942 and a bonus of \$275,000. Such compensation was determined pursuant to the Company's employment agreement with Dr. Rabbani and was based on the Board's view of Dr. Rabbani's successful performance as Chief Executive Officer. See "Employment Agreements."

Submitted by the members of the Compensation Committee

Irwin W. Gerson
John J. Delucca
Melvin F. Lazar

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401(K) PLAN

The Company has adopted a salary reduction profit sharing plan which is generally available to employees of the Company and any subsidiary of the Company. Officers and directors who are employees of the Company participate in the Plan on the same basis as other employees.

The Plan permits voluntary contributions by employees in varying amounts up to 17% of annual earnings (not to exceed the maximum allowable in any calendar year which is \$13,000 for 2004). Employee contributions are made by salary reduction under Section 401(k) of the Internal Revenue Code of 1986, as amended (the "Code"), and are excluded from taxable income of the employee. The Company may also contribute additional discretionary amounts as it may determine.

All employees of the Company who are twenty-one (21) years or older and have been employed by the Company for a minimum of three (3) months are eligible to participate in the Plan. Employees, who have more than 500 hours of service per service year, but less than 1,000 hours per service year, are still considered members of the Plan, but contribution allocations and vesting will not increase during such time.

A participant's account is distributed to him upon retirement or termination of employment for any reason and in certain other limited situations. The amount of the Plan allocation attributable to the Company's discretionary contributions will vest in accordance with a schedule. For the fiscal year ended July 31, 2004, the Company has made contributions of 50% of the employees' contribution up to 10% of the employees' compensation in Common Stock of the Company.

1999 STOCK OPTION PLAN

Under the Company's 1999 Stock Option Plan (the "1999 Plan"), the Company's Board of Directors may grant ISOs and NQSOs to selected key employees, directors, executive officers, consultants and advisors of the Company to purchase the Company's Common Stock. ISOs and NQSOs granted under the 1999 Plan generally vest no earlier than six (6) months after the date of grant and can be exercised no later than the tenth (10th) anniversary date of the date of grant. When the optionee, however, holds more than 10% of all combined voting stock of the Company, ISOs granted under the 1999 Plan cannot be exercised later than the fifth (5th) anniversary date of the date of grant. The exercise prices of options granted under the 1999 Plan are set by the Board of Directors of the Company, or designated committee. In any event, however, ISOs granted under the 1999 Plan may not be exercisable at a price lower than the fair market value of the Company's Common Stock on the date such options are granted, and, when the optionee holds more than 10% of all combined voting stock of the Company, the exercise prices of such options may not be less than 110% of the fair market value of the Common Stock of the Company on the date of grant. ISOs granted under the 1999 Plan to any optionee which become exercisable for the first time in any one calendar year for shares of Common Stock of the Company with an aggregate fair market value, as of the respective date or dates of grant, of more than \$100,000 shall be treated as NQSOs. The awards under the 1999 Plan are subject to restrictions on transferability, are forfeitable in certain circumstances and are exercisable at such time or times and during such period as shall be set forth in the option agreement evidencing such option. During the fiscal year ended July 31, 2004, options to purchase up to 428,925 shares of the Company's Common Stock were awarded under the 1999 Plan. As of the Record Date, of the 2,312,356 shares of the Company's Common Stock reserved for issuance upon the exercise of options authorized for grant under the 1999 Plan, 238,780 shares of the Company's Common Stock remain available for issuance upon the exercise of options authorized for grant under the 1999 Plan.

2005 EQUITY COMPENSATION INCENTIVE PLAN

On October 5, 2004, our Board of Directors approved the adoption, subject

to approval by our shareholders, of its 2005 Equity Compensation Incentive Plan for the purpose of recruiting and retaining our officers, employees, directors, consultants and advisors pursuant to the terms of a program to be administered by our Compensation Committee. As of the Record Date, no grants have been made under such Plan. The 2005 Equity Compensation Incentive Plan is being presented to our shareholders as Proposal 2 for adoption. The full text of such Plan is attached as Exhibit A to this proxy statement.

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INSURANCE FOR INDEMNIFICATION OF DIRECTORS AND OFFICERS

The Company has in effect, with American International Group Companies ("AIG") under a policy effective February 21, 2004, and expiring on February 22, 2005, 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 \$350,000.

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

Elazar Rabbani, Ph.D.
 Shahram K. Rabbani
 Barry W. Weiner
 Marcus A. Conant, M.D.
 John J. Delucca
 Irwin C. Gerson
 Melvin F. Lazar, CPA
 John B. Sias

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PERFORMANCE GRAPH

The graph below compares the five-year cumulative shareholder total return based upon an initial \$100 investment (assuming the reinvestment of dividends) for Enzo Biochem, Inc. shares of Common Stock with the comparable return for the New York Stock Exchange Market Value Index and two peer issuer indices selected on an industry basis. The two peer group indices include: (i) 60 biotechnology companies engaged in the research and development of diagnostic substances and (ii) 10 companies engaged in the medical laboratories business. All of the indices include only companies whose common stock has been registered under Section 12 of the Securities Exchange Act of 1934 for at least the time frame set forth in the graph.

The total shareholder returns depicted in the graph are not necessarily indicative of future performance. The Performance Graph and related disclosure shall not be deemed to be incorporated by reference in any filing by the Company under the Securities Act of 1933 or the Securities Exchange Act of 1934, except to the extent that the Company specifically incorporates the graph and such disclosure by reference.

COMPARE 5-YEAR CUMULATIVE TOTAL RETURN
 AMONG ENZO BIOCHEM, INC.,
 NYSE MARKET INDEX AND SIC CODE INDEX

[Data below represents line chart in printed piece.]

	ENZO BIOCHEM, INC.	MEDICAL LABORATORIES	NYSE MARKET INDEX	BIOTECHNOLOGY PEERS
	-----	-----	-----	-----
1999	100	100	100	100
2000	269.94	212.06	103.52	198.31
2001	133.87	229.22	101.06	164.68
2002	73.91	160.86	81.81	138.24
2003	115.81	171.01	89.75	165.54
2004	76.2	187.98	102.91	184.49

ASSUMES \$100 INVESTED ON AUGUST 1, 1999
 ASSUMES DIVIDEND REINVESTED
 FISCAL YEAR ENDING JULY 31, 2004

COMPARISON OF 5-YEAR CUMULATIVE TOTAL RETURN OF THE
 COMPANY, TWO PEER GROUP INDICES AND THE NYSE MARKET INDEX

	1999	2000	2001	2002	2003	2004
	-----	-----	-----	-----	-----	-----
ENZO BIOCHEM, INC.	100.00	269.94	133.87	73.91	115.81	76.20
MEDICAL LABORATORIES	100.00	212.06	229.22	160.86	171.01	187.98
NYSE MARKET INDEX	100.00	103.52	101.06	81.81	89.75	102.91
BIOTECHNOLOGY PEERS	100.00	198.31	164.68	138.24	165.54	184.49

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PROPOSAL 2
2005 EQUITY COMPENSATION INCENTIVE PLAN PROPOSAL

We have established a 2005 Equity Compensation Incentive Plan (the "2005 Plan") for the purpose of recruiting and retaining our officers, employees, directors and consultants. The 2005 Plan authorizes the issuance of options to purchase shares of common stock and the grant of restricted common stock awards. Section 162(m) of the Code ("Section 162(m)") limits a corporation's income tax deduction for compensation paid to each executive officer to \$1 million per year unless the compensation qualifies as "performance-based compensation." In general, for a grant under the 2005 Plan to qualify as "performance-based compensation," the 2005 Plan must have been approved by the Company's public stockholders. The availability of the exemption for awards of "performance-based compensation" depends upon obtaining approval of the 2005 Plan by the Company's public stockholders. The Board of Directors determined that it was in the best interests of the Company to seek stockholder approval at the Annual Meeting.

The discussion below is a summary of material terms of the 2005 Plan. The discussion below is merely a summary of the Plan and does not provide detailed information for every aspect of the 2005 Plan. For a more complete description of the terms of the 2005 Plan, please see a copy of the 2005 Plan attached as Exhibit A to this proxy statement.

SUMMARY OF THE 2005 EQUITY COMPENSATION INCENTIVE PLAN

ADMINISTRATION

Administration of the 2005 Plan is carried out by the Compensation Committee of the Board of Directors. The Compensation Committee may delegate a portion of its authority under the 2005 Plan to one or more of our officers. As used in this summary, the term "administrator" means the Compensation Committee or its delegate.

ELIGIBILITY

Our officers and employees and those of our subsidiaries are eligible to participate in the 2004 Plan. Our directors and other persons that provide consulting or advisory services to us and our subsidiaries are also eligible to participate in the 2005 Plan. The term subsidiary is used in this summary to refer to both corporate subsidiaries and other entities for which we directly or indirectly control at least 50% of the equity and any other entity in which we have a material equity interest.

MAXIMUM SHARES AND AWARD LIMITS

Under the 2005 Plan, the maximum number of shares of common stock that may be subject to stock options and stock awards is 1,000,000. No one participant may receive awards for more than 200,000 shares of common stock in any one calendar year. These limitations, and the terms of outstanding awards, will be adjusted without the approval of our stockholders as the administrator determines is appropriate in the event of a stock dividend, stock split, reclassification of stock or similar events. If an option terminates, expires or becomes unexercisable, or shares of common stock subject to a stock award are forfeited, the shares subject to such option or stock award are available under the first sentence of this paragraph for future awards under the 2005 Plan. In addition, shares which are issued under any type of award under the 2005 Plan and which are repurchased or reacquired by us at the original purchase price for such shares are also available under the first sentence of this paragraph for future awards under the 2005 Plan.

STOCK OPTIONS

The 2005 Plan provides for the grant of both options intended to qualify as incentive stock options under Section 422 of the Internal Revenue Code (the "Code") and options that are not intended to so qualify. Options intended to qualify as incentive stock options may be granted only to persons who are our employees or are employees of our subsidiaries which are treated as corporations for federal income tax purposes. No participant may be granted incentive stock options that are exercisable for the first time in any calendar year for common stock having a total fair market value (determined as of the option grant) in excess of \$100,000.

The administrator will select the participants who are granted options and, consistent with the terms of the 2005 Plan, will prescribe the terms of each option, including the vesting rules for such option. The option exercise price

cannot be less than the common stock's fair market value on the date the option is granted, and in the event a participant is deemed to be a 10% owner of our Company or one of our subsidiaries, the exercise price of an

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incentive stock option cannot be less than 110% of the common stock's fair market value on the date the option is granted. The 2005 Plan prohibits repricing of an outstanding option, and therefore, the administrator may not, without the consent of the stockholders, lower the exercise price of an outstanding option. This limitation does not, however, prevent adjustments resulting from stock dividends, stock splits, reclassifications of stock or similar events. The option price may be paid in cash or by surrendering shares of common stock, or a combination of cash and shares of common stock. Options may be exercised in accordance with requirements set by the administrator. The maximum period in which an option may be exercised will be fixed by the administrator but cannot exceed ten years, and in the event a participant is deemed to be a 10% owner of our Company or one of our corporate subsidiaries, the maximum period for an incentive stock option granted to such participant cannot exceed five years. Options generally will be nontransferable except in the event of the participant's death but the administrator may allow the transfer of non-qualified stock options through a gift or domestic relations order to the participant's family members.

Unless provided otherwise in a participant's stock option agreement and subject to the maximum exercise period for the option, an option generally will cease to be exercisable upon the earlier of three months following the participant's termination of service with us or the expiration date under the terms of the participant's stock option agreement. The right to exercise an option will expire immediately upon termination if the termination is for "cause" or a voluntary termination any time after an event that would be grounds for termination for cause. Upon death or disability, the option exercise period is extended to the earlier of one year from the participant's termination of service or the expiration date under the terms of the participant's stock option agreement.

STOCK AWARDS AND PERFORMANCE BASED COMPENSATION

The administrator also will select the participants who are granted restricted common stock awards and, consistent with the terms of the 2005 Plan, will establish the terms of each stock award. A restricted common stock award may be subject to payment by the participant of a purchase price for shares of common stock subject to the award, and a stock award may be subject to vesting requirements or transfer restrictions or both, if so provided by the administrator. Those requirements may include, for example, a requirement that the participant complete a specified period of service or that certain performance objectives be achieved. The performance objectives may be based on the individual performance of the participant, our performance or the performance of our subsidiaries, divisions, departments or functions in which the participant is employed or has responsibility. In the case of a performance objective for an award intended to qualify as "performance based compensation" under Section 162(m), the objectives are limited to specified levels of and increases in our or a business unit's return on equity; total earnings; earnings per share; earnings growth; return on capital; return on assets; economic value added; earnings before interest and taxes; earnings before interest, taxes, depreciation and amortization; sales growth; gross margin return on investment; increase in the fair market value of the shares; share price (including but not limited to growth measures and total stockholder return); net operating profit; cash flow (including, but not limited to, operating cash flow and free cash flow); cash flow return on investments (which equals net cash flow divided by total capital); funds from operations; internal rate of return; increase in net present value or expense targets. Transfer of the shares of common stock subject to a stock award normally will be restricted prior to vesting.

AMENDMENT AND TERMINATION

No awards may be granted under the 2005 Plan after the tenth anniversary of the adoption of the 2005 Plan. The Board of Directors may amend or terminate the 2005 Plan at any time, but an amendment will not become effective without the approval of our stockholders if it increases the aggregate number of shares of common stock that may be issued under the 2005 Plan, changes the class of employees eligible to receive incentive stock options or stockholder approval is required by any applicable law, regulation or rule, including any rule of the NYSE. No amendment or termination of the 2005 Plan will affect a participant's rights under outstanding awards without the participant's consent.

FEDERAL INCOME TAX ASPECTS OF THE 2005 PLAN

The following is a brief summary of the federal income tax aspects of awards that may be made under the 2005 Plan based on existing U.S. federal income tax laws. This summary provides only the basic tax rules. It does not describe a number of special tax rules, including the alternative minimum tax and various elections that may be applicable under certain circumstances. The tax consequences of awards under the 2005 Plan depend upon the type of award and if the award is to an executive officer, whether the award qualifies as

INCENTIVE STOCK OPTIONS

The recipient of an incentive stock option generally will not be taxed upon grant of the option. Federal income taxes are generally imposed only when the shares of stock from exercised incentive stock options are disposed of, by sale or otherwise. The amount by which the fair market value of the stock on the date of exercise exceeds the exercise price is, however, included in determining the option recipient's liability for the alternative minimum tax. If the incentive stock option recipient does not sell or dispose of the stock until more than one year after the receipt of the stock and two years after the option was granted, then, upon sale or disposition of the stock, the difference between the exercise price and the market value of the stock as of the date of exercise will be treated as a capital gain, and not ordinary income. If a recipient fails to hold the stock for the minimum required time, at the time of the disposition of the stock, the recipient will recognize ordinary income in the year of disposition in an amount equal to any excess of the market value of the common stock on the date of exercise (or, if less, the amount realized on disposition of the shares) over the exercise price paid for the shares. Any further gain (or loss) realized by the recipient generally will be taxed as short-term or long-term gain (or loss) depending on the holding period. The Company will not receive a tax deduction for incentive stock options which are taxed to a recipient as capital gains; however, the Company will receive a tax deduction if the sale of the stock does not qualify for capital gains tax treatment.

NONQUALIFIED STOCK OPTIONS

The recipient of stock options not qualifying as incentive stock options generally will not be taxed upon the grant of the option. Federal income taxes are generally due from a recipient of nonqualified stock options when the stock options are exercised. The difference between the exercise price of the option and the fair market value of the stock purchased on such date is taxed as ordinary income. Thereafter, the tax basis for the acquired stock is equal to the amount paid for the stock plus the amount of ordinary income recognized by the recipient. The Company will take a tax deduction equal to the amount of ordinary income realized by the option recipient by reason of the exercise of the option.

STOCK AWARDS

The payment of stock awards under the 2005 Plan will generally be treated as ordinary compensation income at the time of payment or, in the case of restricted common stock subject to a vesting requirement, at the time substantial vesting occurs. A recipient who receives restricted shares which are not substantially vested, may, within 30 days of the date the shares are transferred, elect in accordance with Section 83(b) of the Code to recognize ordinary compensation income at the time of transfer of the shares. The amount of ordinary compensation income is equal to the amount of any cash and the amount by which the then fair market value of any common stock received by the participant exceeds the purchase price, if any, paid by the participant. Subject to the application of Section 162(m), the Company will receive a tax deduction for the amount of the compensation income.

SECTION 162(m)

Section 162(m) would render non-deductible to the Company certain compensation in excess of \$1,000,000 in any year to certain officers of the Company unless such excess is "performance-based compensation" (as defined in the Code) or is otherwise exempt from Section 162(m) granted under the 2005 Plan are designed to qualify as performance-based compensation. As described above with respect to restricted common stock, the administrator may condition such awards on attainment of one or more performance goals that are intended to qualify such awards as performance-based compensation.

All future awards under the 2005 Plan will be discretionary and therefore are not determinable at this time.

Approval of the 2005 Equity Compensation Incentive Plan Proposal requires the affirmative vote of a majority of the votes cast on the matter by holders of our outstanding common shares at the Annual Meeting, provided a quorum is present.

THE BOARD OF DIRECTORS RECOMMENDS A VOTE "FOR" PROPOSAL 2 RELATING TO THE APPROVAL AND ADOPTION OF OUR 2005 EQUITY COMPENSATION INCENTIVE PLAN. PROXIES SOLICITED BY THE BOARD OF DIRECTORS WILL BE SO VOTED UNLESS SHAREHOLDERS SPECIFY IN THEIR PROXIES A CONTRARY CHOICE.

The Board of Directors has appointed Ernst & Young LLP, as independent auditors, to audit the accounts of the Company for the fiscal year ending July 31, 2005. The Board of Directors approved the reappointment of Ernst & Young LLP (which has been engaged as the Company's independent auditors since 1983). Ernst & Young LLP has advised the Company that neither the firm nor any of its members or associates has any direct financial interest in the Company or any of its affiliates other than as auditors. Although the selection and appointment of independent auditors is not required to be submitted to a vote of shareholders, the Directors deem it desirable to obtain the shareholders' ratification and approval of this appointment.

The following table sets forth the aggregate fees billed by Ernst & Young LLP for the years ended July 31, 2004 and 2003 for audit and non-audit services (as well as all "out-of-pocket" costs incurred in connection with these services) and are categorized as Audit Fees, Audit-Related Fees, Tax Fees and All Other Fees. The nature of the services provided in each such category is described following the table.

	2004 ----	2003 ----
AUDIT FEES	\$215,000	\$178,000
AUDIT-RELATED FEES	16,000	12,000
TAX FEES	8,000	75,000
ALL OTHER FEES	0	0
	-----	-----
TOTAL FEES	\$239,000	\$265,000
	-----	-----

AUDIT FEES - Consists of professional services rendered in connection with the annual audit of the Company's consolidated financial statements on Form 10-K and quarterly reviews of the Company's interim financial statements on Form 10-Q. Audit fees also include fees for services performed by Ernst & Young LLP that are closely related to the audit and in many cases could only be provided by the Company's independent auditors. Such services include the issuance of comfort letters and consents related to the Company's registration statements and capital raising activities, assistance with and review of other documents filed with the Commission and accounting advice on completed transactions.

AUDIT RELATED FEES - Consists of services related to audits of properties acquired, due diligence services related to contemplated property acquisitions and accounting consultations. The 2004 and 2003 fees were incurred in connection with consultations regarding the Company's implementation of The Sarbanes-Oxley Act of 2002.

TAX FEES - Consists of services related to corporate tax compliance, including review of corporate tax returns, review of the tax treatments for certain expenses and tax due diligence relating to acquisitions.

ALL OTHER FEES - There were no professional services rendered by Ernst & Young LLP that would be classified as other fees during the years ended July 31, 2004 and 2003.

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 auditor. 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 Committee at its next scheduled meeting.

In making its recommendations to ratify the appointment of Ernst & Young LLP as the Company's independent accountants for the fiscal year ending July 31, 2005, the Audit Committee has considered whether the non-audit services provided by Ernst & Young LLP are compatible with maintaining the independence of Ernst & Young LLP.

Representatives of Ernst & Young LLP are expected to be present at the Annual Meeting with the opportunity to make a statement if they desire to do so and are expected to be available to respond to appropriate questions.

THE BOARD OF DIRECTORS RECOMMENDS A VOTE "FOR" PROPOSAL 3 RELATING TO THE RATIFICATION OF THE APPOINTMENT OF THE AUDITORS. PROXIES SOLICITED BY THE BOARD OF DIRECTORS WILL BE SO VOTED UNLESS SHAREHOLDERS SPECIFY IN THEIR PROXIES A CONTRARY CHOICE.

stated in this Proxy Statement which are to be presented for action at the meeting. If any other matters should properly come before the meeting, it is intended that proxies in the accompanying form will be voted on any such matters in accordance with the judgment of the persons voting such proxies. Discretionary authority to vote on such matters is conferred by such proxies upon the persons voting them.

The Company will bear the cost of preparing, assembling and mailing the Proxy, Proxy Statement 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. In addition, American Stock Transfer & Trust Company, 6201 15th Avenue, Brooklyn, NY 11219, the Company's transfer agent, has been engaged to solicit proxies on behalf of the Company for a fee, excluding expenses, of approximately \$5,000. Proxies may be solicited by mail, personal interview, telephone and telegraph.

ENZO WEBSITE

In addition to the information about the Company and its subsidiaries contained in this proxy statement, extensive 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 of Directors. 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: Enzo Biochem, Inc., 60 Executive Boulevard, Farmingdale, New York 11735, Attn: Corporate Secretary.

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.

THE COMPANY WILL PROVIDE WITHOUT CHARGE TO EACH PERSON BEING SOLICITED BY THIS PROXY STATEMENT, UPON THE WRITTEN REQUEST OF ANY SUCH PERSON, A COPY OF THE ANNUAL REPORT OF THE COMPANY ON FORM 10-K FOR THE YEAR ENDED JULY 31, 2004 (AS FILED WITH THE SECURITIES AND EXCHANGE COMMISSION) INCLUDING THE FINANCIAL STATEMENTS AND THE SCHEDULES THERETO. ALL SUCH REQUESTS SHOULD BE DIRECTED TO SHAHRAM K. RABBANI, SECRETARY, ENZO BIOCHEM, INC., 60 EXECUTIVE BOULEVARD, FARMINGDALE, NEW YORK 11735.

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SHAREHOLDER PROPOSALS TO BE PRESENTED AT THE NEXT ANNUAL MEETING

SHAREHOLDER PROPOSALS. Proposals of shareholders intended to be presented at the Company's 2005 Annual Shareholder Meeting (i) must be received by the Company at its offices no later than July 29, 2005 (120 days preceding the one year anniversary of the Mailing Date), (ii) may not exceed 500 words and (iii) must otherwise satisfy the conditions established by the Securities and Exchange Commission for stockholder proposals to be included in the Company's Proxy Statement and form of proxy for that meeting.

DISCRETIONARY PROPOSALS. Shareholders intending to commence their own proxy solicitations and present proposals from the floor of the 2005 Annual Shareholder Meeting in compliance with Rule 14a-4 promulgated under the Exchange Act of 1934, as amended, must notify the Company of such intentions before October 12, 2005 (45 days preceding the one year anniversary of the Mailing Date). After such date, the Company's proxy in connection with the 2005 Annual Shareholder Meeting may confer discretionary authority on the Board to vote.

By Order of the Board of Directors

Shahram K. Rabbani, Secretary

Dated: November 26, 2004

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PROXY

ENZO BIOCHEM, INC.
60 EXECUTIVE BOULEVARD, FARMINGDALE, NEW YORK 11735

THIS PROXY IS SOLICITED ON BEHALF OF THE BOARD OF DIRECTORS

The undersigned hereby appoints Elazar Rabbani, Ph.D. and Shahram K. Rabbani as Proxies, each with the power to appoint his substitute, and hereby authorizes them to represent and to vote, as designated below, all the shares of the Common Stock of Enzo Biochem, Inc. held of record by the undersigned on November 24, 2004, at the Annual Meeting of Shareholders to be held on January 20, 2005 or any adjournment thereof.

PROPOSAL 1. Election of Barry W. Weiner, John J. Delucca and Melvin F. Lazar, CPA as Class II Directors.

[] FOR all nominees (except as marked to the contrary below) [] WITHHOLDING AUTHORITY as to all nominees

(INSTRUCTION: To withhold authority to vote for any individual nominee, print that nominee's name on the line provided below.)

Withheld for: _____

PROPOSAL 2. To consider and vote upon a proposal to approve and adopt our 2005 Equity Compensation Incentive Plan (which we refer to in the accompanying proxy statement as the "2005 Equity Compensation Incentive Plan Proposal").

[] FOR [] AGAINST [] ABSTAIN

PROPOSAL 3. Ratification of the appointment of Ernst & Young LLP as independent auditors for the fiscal year ending July 31, 2005.

[] FOR [] AGAINST [] ABSTAIN

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 Proposals 1,2 and 3.

PLEASE SIGN EXACTLY AS NAME APPEARS BELOW. WHEN SHARES OF COMMON STOCK ARE HELD BY JOINT TENANTS, BOTH SHOULD SIGN.

Dated: _____, 2004 / 2005 (circle one)

Signature: _____

Signature if held jointly: _____

(When signing as attorney, as executor, as administrator, trustee or guardian, please give full title as such. If a corporation, please sign in full corporate name by President or other authorized officer. If a partnership, please sign in partnership name by authorized person.)