

OMB APPROVAL

OMB Number: 3235-0059
Expires: February 28, 2006
Estimated average burden
hours per response...12.75

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

SCHEDULE 14A

Proxy Statement Pursuant to Section 14(a) of the Securities
Exchange Act of 1934 (Amendment No.)

Filed by the Registrant []
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))
- Definitive Proxy Statement
- Definitive Additional Materials
- Soliciting Material Pursuant to Section 240.14a-12

LEXICON GENETICS 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):

- 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:

- Fee paid previously with preliminary materials.
- 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:

4) Date Filed:

PERSONS WHO POTENTIALLY ARE TO RESPOND TO THE COLLECTION OF INFORMATION CONTAINED IN THIS FORM ARE NOT REQUIRED TO RESPOND UNLESS THE FORM DISPLAYS A CURRENTLY VALID OMB CONTROL NUMBER.

SEC 1913 (02-02)

[LEXICON LOGO]

March 28, 2005

TO OUR STOCKHOLDERS:

I am pleased to invite you to attend the 2005 annual meeting of stockholders of Lexicon Genetics Incorporated to be held on Wednesday, April 27, 2005 at 1:30 p.m., local time, at The Marriott Woodlands Waterway Hotel and Convention Center, 1601 Lake Robbins Drive, The Woodlands, Texas. We have enclosed with this letter:

- an official notice of the annual meeting;
- a proxy statement that describes the matters to be considered and acted upon at the annual meeting; and
- a form of proxy that we are asking you to complete and return to us, indicating your vote with respect to the matters described in the proxy statement.

Your vote is important, regardless of the number of shares that you hold. Whether or not you plan to attend the annual meeting, I hope you will vote as soon as possible by signing and returning the enclosed form of proxy in the postage-paid envelope we have provided for that purpose.

Thank you for your ongoing support of and continued interest in Lexicon Genetics. We look forward to seeing you at the annual meeting.

Sincerely,

/s/ Arthur T. Sands

Arthur T. Sands, M.D., Ph.D.
President and Chief Executive Officer

LEXICON GENETICS INCORPORATED
8800 TECHNOLOGY FOREST PLACE
THE WOODLANDS, TEXAS 77381
(281) 863-3000

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
TO BE HELD APRIL 27, 2005

TO OUR STOCKHOLDERS:

The annual meeting of stockholders of Lexicon Genetics Incorporated will be held on Wednesday, April 27, 2005 at 1:30 p.m., local time, at The Marriott Woodlands Waterway Hotel and Convention Center, 1601 Lake Robbins Drive, The Woodlands, Texas, to:

- elect two Class II directors;
- ratify and approve an amendment to our 2000 Non-Employee Directors' Stock Option Plan increasing the number of shares of common stock underlying each annual option grant from 6,000 shares to 10,000 shares;
- ratify and approve the appointment of Ernst & Young LLP as our independent auditors for the fiscal year ending December 31, 2005; and
- act on any other business that properly comes before the annual meeting.

You are entitled to vote at the annual meeting only if you are the record owner of shares of our common stock at the close of business on March 8, 2005.

It is important that your shares be represented at the annual meeting whether or not you plan to attend. PLEASE MARK, SIGN AND DATE THE ENCLOSED PROXY AND RETURN IT IN THE ACCOMPANYING POSTPAID ENVELOPE AS PROMPTLY AS POSSIBLE. If you are present at the annual meeting, and wish to do so, you may revoke the proxy and vote in person.

By order of the Board of Directors,

/s/ Jeffrey L. Wade

Jeffrey L. Wade
Secretary

The Woodlands, Texas
March 28, 2005

LEXICON GENETICS INCORPORATED
8800 TECHNOLOGY FOREST PLACE
THE WOODLANDS, TEXAS 77381
(281) 863-3000

PROXY STATEMENT
FOR
ANNUAL MEETING OF STOCKHOLDERS

TO BE HELD APRIL 27, 2005

GENERAL INFORMATION

PURPOSE OF THIS PROXY STATEMENT

We have prepared this proxy statement to solicit proxies on behalf of our Board of Directors for use at our 2005 annual meeting of stockholders and any adjournment or postponement thereof. We are mailing this proxy statement and the accompanying notice of annual meeting of stockholders and form of proxy to our stockholders on or about March 28, 2005.

TIME AND PLACE OF ANNUAL MEETING

The annual meeting will be held on Wednesday, April 27, 2005 at 1:30 p.m., local time, at The Marriott Woodlands Waterway Hotel and Convention Center, 1601 Lake Robbins Drive, The Woodlands, Texas.

MATTERS TO BE CONSIDERED AT THE ANNUAL MEETING

At the annual meeting, our stockholders will be asked to consider and act upon the following matters:

- the election of two Class II directors;
- a proposal to ratify and approve an amendment to our 2000 Non-Employee Directors' Stock Option Plan increasing the number of shares of common stock underlying each annual option grant from 6,000 shares to 10,000 shares; and
- a proposal to ratify and approve the appointment of Ernst & Young LLP as our independent auditors for the fiscal year ending December 31, 2005.

Our Board of Directors does not intend to bring any other matters before the annual meeting and has not been informed that any other matters are to be presented by others. Our bylaws contain several requirements that must be satisfied in order for any of our stockholders to bring a proposal before one of our annual meetings, including a requirement of delivering proper advance notice to us. Stockholders are advised to review our bylaws if they intend to present a proposal at any of our annual meetings.

RECORD DATE FOR DETERMINING ENTITLEMENT TO VOTE

You are entitled to vote at the annual meeting if you were the record owner of shares of our common stock as of the close of business on March 8, 2005, the record date for the annual meeting established by our Board of Directors.

HOW TO VOTE YOUR SHARES

You may vote in person at the annual meeting or by proxy. To ensure that your shares are represented at the annual meeting, we recommend you vote by proxy even if you plan to attend the annual meeting in person. Even if you

vote by proxy, if you wish, you can revoke your proxy and vote in person at the annual meeting. If you want to vote at the annual meeting but your shares are held by an intermediary, such as a broker or bank, you will need to obtain from the intermediary either proof of your ownership of such shares as of March 8, 2005 or a proxy to vote your shares.

You may receive more than one proxy depending on how you hold your shares. If you hold your shares through someone else, such as a broker or a bank, you may get materials from them asking you how you want your shares to be voted at the annual meeting.

QUORUM

We must have a quorum to conduct any business at the annual meeting. This means that at least a majority of our outstanding shares eligible to vote at the annual meeting must be represented at the annual meeting, either in person or by proxy. Abstentions are counted for purposes of determining whether a quorum is present. In addition, shares of our common stock held by intermediaries that are voted for at least one matter at the annual meeting will be counted as being present for purposes of determining a quorum for all matters, even if the beneficial owner's discretion has been withheld for voting on some or all other matters (commonly referred to as a "broker non-vote").

OUTSTANDING SHARES

On the record date, we had 63,538,171 shares of our common stock outstanding. If you were the record owner of shares of our common stock on the record date, you will be entitled to one vote for each share of stock that you own on each matter that is called to vote at the annual meeting.

VOTE NEEDED TO APPROVE PROPOSALS

Our Class II directors will be elected by a plurality vote. As a result, if a quorum is present at the annual meeting, the two persons receiving the greatest number of votes will be elected to serve as our Class II directors. Withholding authority to vote for a director nominee will not affect the outcome of the election of directors.

The ratification and approval of the amendment to our 2000 Non-Employee Directors' Stock Option Plan, the appointment of Ernst & Young LLP as our independent auditors for the year ending December 31, 2005 and any other business that may properly come before the annual meeting for a vote, will require a majority of the votes cast with respect to such matter (unless a greater vote is required by law or our charter or bylaws). On any such matter, an abstention from voting will have the same effect as a vote against the proposal. Broker non-votes do not count as votes for or against these proposals and are not considered in calculating the number of votes necessary for approval.

HOW YOUR PROXY WILL BE VOTED

Giving us your proxy means that you are authorizing us to vote your shares at the annual meeting in the manner you direct. You may vote for our nominees for election as Class II directors or withhold your vote for any one or more of those nominees. You may vote for or against the proposals to ratify and approve the amendment to our 2000 Non-Employee Directors' Stock Option Plan and the appointment of Ernst & Young LLP as our independent auditors for the year ending December 31, 2005, or abstain from voting on those proposals.

If you sign and return the enclosed proxy card and do not withhold authority to vote for the election of our nominees for election as Class II directors, all of your shares will be voted for the election of those nominees. If you withhold authority to vote for one or more of our nominees for election as Class II directors, none of your shares will be voted for those nominees.

If any of our nominees for election as Class II directors become unavailable for any reason before the election, we may reduce the number of directors serving on our Board of Directors, or our Board of Directors may designate substitute nominees, as necessary. We have no reason to believe that any of our nominees for election as Class II directors will be unavailable. If our Board of Directors designates any substitute nominees, the persons named in the enclosed proxy card will vote your shares for such substitute(s) if they are instructed to do so by our Board of Directors or, in the absence of any such instructions, in accordance with their own best judgment.

If you sign and return the enclosed proxy but do not specify how you want your shares voted, your shares will be voted in favor of our nominees for election as Class II directors and in favor of the proposals to ratify and approve the

amendment to our 2000 Non-Employee Directors' Stock Option Plan and the appointment of Ernst & Young LLP as our independent auditors for the year ending December 31, 2005.

If you sign and return the enclosed proxy and any additional business properly comes before the annual meeting, the persons named in the enclosed proxy will vote your shares on those matters as instructed by our Board of Directors or, in the absence of any such instructions, in accordance with their own best judgment. As of the date of this proxy statement, we are not aware of any other matter to be raised at the annual meeting.

HOW TO REVOKE YOUR PROXY

You may revoke your proxy at any time before your shares are voted by providing our Corporate Secretary with either a new proxy with a later date or a written notice of your desire to revoke your proxy at the following address:

Lexicon Genetics Incorporated
8800 Technology Forest Place
The Woodlands, Texas 77381
Attention: Corporate Secretary

You may also revoke your proxy at any time prior to your shares having been voted by attending the annual meeting in person and notifying the inspector of election of your desire to revoke your proxy. Your proxy will not automatically be revoked merely because you attend the annual meeting.

INSPECTOR OF ELECTION

Mellon Investor Services L.L.C., our transfer agent and registrar, will count votes and provide a representative who will serve as an inspector of election for the annual meeting.

LIST OF STOCKHOLDERS ENTITLED TO VOTE

A list of our stockholders entitled to vote at the annual meeting will be available for inspection at the annual meeting. The stockholder list will also be available for inspection for ten days prior to the annual meeting at our corporate offices located at 8800 Technology Forest Place, The Woodlands, Texas. Any inspection of this list at our offices will need to be conducted during ordinary business hours. If you wish to conduct an inspection of the stockholder list, we request that you please contact our Corporate Secretary before coming to our offices.

SOLICITATION OF PROXIES AND EXPENSES

We are asking for your proxy on behalf of our Board of Directors. We will bear the entire cost of preparing, printing and soliciting proxies. We will send proxy solicitation materials to all of our stockholders of record as of the record date and to all intermediaries, such as brokers and banks, that held any of our shares on that date on behalf of others. These intermediaries will then forward solicitation materials to the beneficial owners of our shares, and we will reimburse them for their reasonable out-of-pocket expenses for forwarding such materials. Our directors, officers and employees may solicit proxies by mail, in person or by telephone or other electronic communication. Our directors, officers and employees will not receive additional compensation for their solicitation efforts, but they will be reimbursed for any out-of-pocket expenses they incur.

HOUSEHOLDING OF ANNUAL DISCLOSURE DOCUMENTS

The Securities and Exchange Commission has approved a rule allowing us to send a single set of our annual report and proxy statement to any household at which two or more stockholders reside if we believe the stockholders are members of the same family. This rule benefits both you and us by reducing the volume of duplicate information received at your household and helping to reduce our expenses. The rule applies to our annual reports, proxy statements and information statements. Each stockholder will continue to receive a separate proxy card or voting instruction card.

If your household received a single set of disclosure documents for this year, but you would prefer to receive your own copy, please contact our transfer agent, Mellon Investor Services L.L.C., by calling their toll-free number, (800) 635-9270. If you would like to receive your own set of our annual disclosure documents in future years, follow the instructions described below. Similarly, if you share an address with another stockholder and together both of you would like to receive only a single set of our annual disclosure documents, follow these instructions:

- If your shares are registered in your own name, please contact our transfer agent, Mellon Investor Services, and inform them of your request by calling them at (800) 635-9270 or writing them at 85 Challenger Road, Ridgefield Park, New Jersey 07660.
- If a broker or other nominee holds your shares, please contact ADP and inform them of your request by calling them at (888) 603-5847 or writing them at Householding Department, 51 Mercedes Way, Edgewood, New York 11717. Be sure to include your name, the name of your brokerage firm and your account number.

STOCK OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table presents information regarding the beneficial ownership of our common stock as of March 8, 2005 by:

- each of the individuals listed in "Executive Compensation - Summary Compensation Table";
- each of our directors;
- each person, or group of affiliated persons, who is known by us to own beneficially five percent or more of our common stock; and
- all current directors and executive officers as a group.

Beneficial ownership is determined in accordance with the rules of the Securities and Exchange Commission computing the number of shares beneficially owned by a person and the percentage ownership of that person. Shares of common stock under options held by that person that are currently exercisable or exercisable within 60 days of March 8, 2005 are considered outstanding. These shares, however, are not considered outstanding when computing the percentage ownership of each other person.

Except as indicated in the footnotes to this table and pursuant to state community property laws, each stockholder named in the table has sole voting and investment power for the shares shown as beneficially owned by them. Percentage of ownership is based on 63,538,171 shares of common stock outstanding on March 8, 2005. Unless otherwise indicated in the footnotes, the address of each of the individuals named below is: c/o Lexicon Genetics Incorporated, 8800 Technology Forest Place, The Woodlands, Texas 77381.

BENEFICIAL OWNERSHIP

	SHARES ISSUABLE PURSUANT TO OPTIONS		PERCENTAGE OWNERSHIP
	NUMBER OF SHARES BENEFICIALLY OWNED	EXERCISABLE WITHIN 60 DAYS OF MARCH 8, 2005	
Royce & Associates, LLC (1).....	7,913,700	-	12.5%
Robert C. McNair (2).....	5,949,400	-	9.3%
Mary H. Cain, James D. Weaver and William A. McMinn (3).....	4,561,091	-	7.2%
Barclays Global Investors, NA. and Barclays Global Fund Advisors (4)...	4,190,688	-	6.6%
Baylor College of Medicine (5).....	4,055,960	-	6.4%
Arthur T. Sands, M.D., Ph.D. (6).....	1,028,362	2,789,001	5.8%
Julia P. Gregory (7).....	66,047	625,147	1.1%
Jeffrey L. Wade, J.D.	3,000	655,724	1.0%
Brian P. Zambrowicz, Ph.D.	-	1,038,935	1.6%
Alan J. Main, Ph.D.	-	395,375	*
Samuel L. Barker, Ph.D.	7,000	53,500	*
C. Thomas Caskey, M.D (8).....	1,683,900	213,500	3.0%
Patricia M. Cloherty.....	-	49,000	*
Robert J. Lefkowitz, M.D.	-	42,500	*
Alan S. Nies, M.D.	-	15,750	*
Frank Palantoni.....	-	3,000	*
Clayton S. Rose.....	10,000	4,500	*
All directors and executive officers as a group (6)(7)(8) (15 persons)...	2,805,609	6,651,922	13.5%

* Represents beneficial ownership of less than 1 percent.

- (1) Based upon a Schedule 13G filed with the SEC on January 31, 2005, reflecting the beneficial ownership of our common stock by Royce & Associates, LLC. The address for Royce & Associates, LLC is 1414 Avenue of the Americas, New York, New York 10019.
- (2) Based upon a Schedule 13D filed with the SEC on July 18, 2003, reflecting the beneficial ownership of our common stock by RCM Financial Services, L.P. (4,250,000 shares), Cogene Biotech Ventures, L.P. (1,679,400 shares) and Palmetto Partners, Ltd. (20,000 shares). Mr. McNair has sole voting and investment power with respect to all of such shares. The address for Mr. McNair is 4400 Post Oak Parkway, Suite 1400, Houston, Texas 77027.
- (3) Based upon a Schedule 13D/A filed with the SEC on January 2, 2004 and certain representations made to us by the Estate of Gordon A. Cain and the Gordon and Mary Cain Foundation. Reflects the beneficial ownership of our common stock by the Estate of Gordon A. Cain (2,937,000 shares), the Gordon and Mary Cain Foundation (550,000 shares), Mr. Weaver (15,000 shares) and Mr. McMinn (1,059,091 shares). Mrs. Cain and Mr. Weaver are co-executors of the Estate of Gordon A. Cain and share investment power with respect to the shares held by it. The shares held by or issuable to the Estate of Gordon A. Cain are subject to a proxy granted to Mr. McMinn by Mr. Cain to vote these shares in the event of Mr. Cain's incapacity or death. The proxy will terminate upon the distribution of the shares from Mr. Cain's estate. Mr. McMinn disclaims beneficial ownership of these shares. Mrs. Cain is Chairman and Mr. Weaver is President of the Gordon and Mary Cain Foundation and share voting and investment power with respect to the shares held by it. The address for Mrs. Cain, Mr. Weaver and Mr. McMinn is c/o Gordon Cain and Associates, 8 Greenway Plaza, Suite 702, Houston, Texas 77046.
- (4) Based upon a Schedule 13G filed with the SEC on February 14, 2005, reflecting the beneficial ownership of our common stock by Barclays Global Investors, NA. (3,116,439 shares) and Barclays Global Fund Advisors (1,074,249 shares). Barclays Global Investors, NA. has sole voting power with respect to 2,721,420 shares and sole investment power with respect to 3,116,439 shares. Barclays Global Fund Advisors has sole voting and investment power with respect to 1,074,249 shares. The address for Barclays Global Investors, NA. and Barclays Global Fund Advisors is 45 Fremont Street, San Francisco, California 94105.
- (5) Based upon a Schedule 13G/A filed with the SEC on January 6, 2005, reflecting the beneficial ownership of our common stock by Baylor College of Medicine and BCM Technologies Inc., a wholly owned subsidiary of Baylor College of Medicine. The number of shares beneficially owned includes 28,940 shares owned by BCM Technologies, Inc. The address of Baylor College of Medicine is One Baylor Plaza, T-140, Houston, Texas 77030-3498.

- (6) The number of shares beneficially owned by Dr. Sands includes 60,000 shares held in the name of minor children and 817,500 shares owned by Sands Associates LP. The general partners of Sands Associates LP are ATS Associates, L.L.C., owned by Dr. Sands, and MES Associates, L.L.C., owned by Dr. Sands' wife.
- (7) The number of shares beneficially owned by Ms. Gregory includes 4,847 shares held in the name of dependent children and trusts for their benefit of which she serves as a trustee.
- (8) The number of shares beneficially owned by Dr. Caskey includes 1,679,400 shares owned by Cogene Biotech Ventures, L.P., of which Dr. Caskey is Managing Director, and 200 shares held in the name of minor children. Dr. Caskey disclaims beneficial ownership of the shares owned by Cogene Biotech Ventures, L.P.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Exchange Act requires our directors and officers, and persons who own more than 10% of our common stock, to file initial reports of ownership and reports of changes in ownership of our common stock with the Securities and Exchange Commission. Directors, officers and greater than 10% stockholders are required by Securities and Exchange Commission regulations to furnish us with copies of all such forms that they file.

To our knowledge, based solely on our review of the copies of such reports received by us and on written representations by certain reporting persons that no reports on Form 5 were required, we believe that during the fiscal year ended December 31, 2004, all Section 16(a) filing requirements applicable to our officers, directors and 10% stockholders were complied with in a timely manner.

EQUITY COMPENSATION PLAN INFORMATION

The following table presents aggregate summary information as of December 31, 2004 regarding the common stock that may be issued upon exercise of options, warrants and rights under all of our existing equity compensation plans, including our 2000 Equity Incentive Plan, 2000 Non-Employee Directors' Stock Option Plan and Coelacanth Corporation 1999 Stock Option Plan.

PLAN CATEGORY	(a) NUMBER OF SECURITIES TO BE ISSUED UPON EXERCISE OF OUTSTANDING OPTIONS, WARRANTS AND RIGHTS	(b) WEIGHTED AVERAGE EXERCISE PRICE PER SHARE OF OUTSTANDING OPTIONS, WARRANTS AND RIGHTS	(c) NUMBER OF SECURITIES REMAINING AVAILABLE FOR FUTURE ISSUANCE UNDER EQUITY COMPENSATION PLANS (EXCLUDING SECURITIES REFLECTED IN COLUMN (a))
Equity compensation plans approved by security holders (1)	13,224,084	\$ 6.2232	1,920,070(3)(4)(5)
Equity compensation plans not approved by security holders (2)	74,821	2.3263	-
Total.....	13,298,905	\$ 6.2013	1,920,070

- (1) Consists of shares of our common stock issued or remaining available for issuance under our 2000 Equity Incentive Plan and 2000 Non-Employee Directors' Stock Option Plan.
- (2) Consists of shares of our common stock issuable upon the exercise of options granted under the Coelacanth Corporation 1999 Stock Option Plan, which we assumed in connection with our July 2001 acquisition of Coelacanth Corporation, but does not include warrants to purchase 16,483 shares of common stock at a weighted average exercise price of \$11.93 per share, which we also assumed in connection with our acquisition of Coelacanth.
- (3) Includes 1,518,070 shares available for future issuance under our 2000 Equity Incentive Plan, some or all of which may be awarded as stock bonuses.
- (4) Our 2000 Equity Incentive Plan provides that on each January 1, the number of shares available for issuance under the plan will be automatically increased by the greater of (i) five percent of our outstanding shares on a fully-diluted basis or (ii) the number of shares that could be issued under awards granted under the plan during the prior year. Our Board of Directors may provide for a lesser increase in the number of shares available for issuance under the plan.

- (5) Our 2000 Non-Employee Directors' Stock Option Plan provides that on the day following each annual meeting of stockholders, the number of shares available for issuance under the plan will be automatically increased by the greater of (i) 0.3% of our outstanding shares on a fully-diluted basis or (ii) the number of shares that could be issued under options granted under the plan during the prior year. Our Board of Directors may provide for a lesser increase in the number of shares available for issuance under the plan.

PROPOSAL NUMBER 1:
ELECTION OF DIRECTORS

Our Board of Directors, which currently has eight members, is divided or "classified" into three classes. Directors in each class are elected to hold office for a term ending on the date of the third annual meeting following the annual meeting at which they were elected. The current term of our Class II directors will expire at this annual meeting. The current terms of our Class III and Class I directors will expire at our 2006 and 2007 annual meetings of stockholders, respectively.

The Board of Directors has nominated and urges you to vote for the election of the individuals identified below, who have been nominated to serve as Class II directors until our 2008 annual meeting of stockholders or until their successors are duly elected and qualified. Each of these individuals is a member of our present Board of Directors. Your signed proxy will be voted for the nominees named below unless you specifically indicate on the proxy that you are withholding your vote.

It is our policy to encourage the members of our Board of Directors to attend all annual meetings of stockholders. Five members of our Board of Directors attended our 2004 annual meeting of stockholders.

NOMINEES FOR CLASS II DIRECTORS

The following individuals are nominated for election as Class II directors:

NAME	AGE	POSITION WITH THE COMPANY	YEAR FIRST BECAME A DIRECTOR
Samuel L. Barker, Ph.D.	62	Chairman of the Board of Directors (Class II)	2000
Patricia M. Cloherty	62	Director (Class II)	1998

Samuel L. Barker, Ph.D. has been a director since March 2000 and became Chairman of our Board of Directors in March 2005. In March 2001, Dr. Barker co-founded Clearview Projects, Inc., a provider of partnering and transaction services to biopharmaceutical companies, and served as its President and Chief Executive Officer from July 2003 until November 2004. Dr. Barker served in a series of leadership positions at Bristol-Myers Squibb Company until his retirement in 1999. His positions at Bristol-Myers Squibb included service as executive vice president, Worldwide Franchise Management and Strategy during 1998; president, United States Pharmaceuticals from 1992 to 1997; and president, Bristol-Myers Squibb Intercontinental Commercial Operations from 1990 to 1992. Prior to 1990, Dr. Barker held executive positions in research and development, manufacturing, finance, business development and sales and marketing at Squibb Pharmaceuticals. Dr. Barker received his B.S. from Henderson State College, his M.S. from the University of Arkansas and his Ph.D. from Purdue University.

Patricia M. Cloherty has been a director since May 1998. Ms. Cloherty has served as Chairman of the United States Russia Investment Fund, established by the United States government to invest in Russian companies, since President Clinton appointed her to that position in 1995. In July 2003, Directors of the Fund also elected her to the position of Chief Executive Officer, a full-time position she currently holds in Moscow, Russia. From 1973 through 1999, she was General Partner of Patricof & Co. Ventures, Inc., an international venture capital company, and successively served as Senior Vice President, President and Co-Chairman of that company. Ms. Cloherty served as deputy administrator of the United States Small Business Administration from 1977 to 1978. She is past president and chairman of the National Venture Capital Association. Ms. Cloherty serves as a director of several private companies and philanthropies. She holds a B.A. from the San Francisco College for Women and an M.A. and an M.I.A. from Columbia University.

THE BOARD OF DIRECTORS RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" THE FOREGOING NOMINEES FOR ELECTION AS CLASS II DIRECTORS.

CURRENT AND CONTINUING DIRECTORS

The current directors of the Company are identified below:

NAME	AGE	POSITION WITH THE COMPANY
Arthur T. Sands, M.D., Ph.D.	43	President and Chief Executive Officer and Director (Class III)
Samuel L. Barker, Ph.D.(1)(2)	62	Chairman of the Board of Directors (Class II)
C. Thomas Caskey, M.D.	66	Director (Class III)
Patricia M. Cloherty(1)(2)	62	Director (Class II)
Robert J. Lefkowitz, M.D.(3)	61	Director (Class I)
Alan S. Nies, M.D.	67	Director (Class I)
Frank Palantoni(2)(3)	47	Director (Class III)
Clayton S. Rose(1)(2)	46	Director (Class I)

(1) Member of the Audit Committee

(2) Member of the Compensation Committee

(3) Member of the Corporate Governance Committee

Information regarding the business experience of Dr. Barker and Ms. Cloherty is set forth above under the heading "- Nominees for Class II Directors."

Arthur T. Sands, M.D., Ph.D. co-founded our company and has been our President and Chief Executive Officer and a director since September 1995. At Lexicon, Dr. Sands pioneered the development of large-scale gene knockout technology for use in drug discovery. Before founding Lexicon, Dr. Sands served as an American Cancer Society postdoctoral fellow in the Department of Human and Molecular Genetics at Baylor College of Medicine. He received his B.A. in Economics and Political Science from Yale University and his M.D. and Ph.D. from Baylor College of Medicine.

C. Thomas Caskey, M.D. has been a director since April 2000 and was the Chairman of our Board of Directors from April 2000 to March 2005. Dr. Caskey has been Managing Director of Cogene Biotech Ventures, Ltd., a venture capital firm, since March 2005 and served as President and Chief Executive Officer of the firm from April 2000 to March 2005. He served as Senior Vice President, Research at Merck Research Laboratories, a division of Merck & Co., Inc., from 1995 to March 2000 and as President of the Merck Genome Research Institute from 1996 to March 2000. Before joining Merck, Dr. Caskey served 25 years at Baylor College of Medicine in a series of senior positions, including Chairman, Department of Human and Molecular Genetics and Director, Human Genome Center. He is a member of the National Academy of Sciences. Dr. Caskey serves as a director of Luminex Corporation and several private companies. He received his B.A. from the University of South Carolina and his M.D. from Duke University Medical School.

Robert J. Lefkowitz, M.D. has been a director since February 2001 and a consultant to our company since March 2003. Dr. Lefkowitz is the James B. Duke Professor of Medicine and Biochemistry and a Howard Hughes Medical Institute investigator at Duke University Medical Center, where he has served on the faculty since 1973. He is a member of the National Academy of Sciences. Dr. Lefkowitz received his B.A. from Columbia University and his M.D. from Columbia University College of Physicians and Surgeons.

Alan S. Nies, M.D. has been a director since November 2003 and Chairman of our Medical Advisory Board since March 2003. From 1992 through September 2002, Dr. Nies served in a series of senior management positions at Merck & Co. Inc., most recently as Senior Vice President, Clinical Sciences from 1999 to 2002. Prior to joining Merck, Dr. Nies spent fifteen years as Professor of Medicine and Pharmacology and Head of the Division of Clinical Pharmacology at the University of Colorado Health Sciences Center. Dr. Nies holds a B.S. from Stanford University and an M.D. from Harvard Medical School.

Frank Palantoni has been a director since November 2004. From 1998 to 2004, Mr. Palantoni held a variety of senior management positions with Novartis AG, most recently as president and chief executive officer, worldwide of its Gerber Products Company, Novartis Infant and Baby Division. Mr. Palantoni also served as president and chief executive officer for North American operations of Novartis Consumer Health Division from 2000 to 2001. Prior to joining Novartis, he held a series of senior management positions with The Danone Group. Mr. Palantoni currently serves as a

director of Gerber Life Insurance Company. He holds a B.S. from Tufts University and an M.B.A. from Columbia University.

Clayton S. Rose has been a director since July 2004. Mr. Rose has been an adjunct professor at Columbia University's Graduate School of Business and New York University's Stern School of Business since 2002. From 1981 through 2000, Mr. Rose worked at JP Morgan & Co, Inc. He held a series of senior management positions at JP Morgan, including heading each of the firm's Global Investment Banking and Global Equities divisions and serving as a member of the firm's executive committee. He also served as Vice Chairman and Chief Operating Officer of the investment bank of JP Morgan Chase & Co. following the merger of the two firms. Mr. Rose serves as a director of Mercantile Bankshares Corporation, the YMCA of Greater New York and Public/Private Ventures and is a member of the Visiting Committee for the College and the Council for the Graduate School of Business at the University of Chicago. He received his A.B and M.B.A. from the University of Chicago.

INDEPENDENCE OF THE BOARD OF DIRECTORS

After reviewing all relevant transactions and relationships between each member of the Board of Directors (and his or her family) and us, our senior management and our independent auditors, the Board of Directors has affirmatively determined that Samuel L. Barker, Ph.D., Patricia M. Cloherty, Robert J. Lefkowitz, M.D., Frank Palantoni and Clayton S. Rose, which members constitute a majority of the Board of Directors, are "independent" in accordance with the applicable listing standards of The Nasdaq Stock Market, Inc.

BOARD COMMITTEES

Audit Committee. Our audit committee monitors the integrity of our financial statements, reviews our internal accounting procedures and oversees the qualifications, independence and performance of our independent auditors. The current members of our audit committee are Clayton S. Rose (chair), Samuel L. Barker, Ph.D. and Patricia M. Cloherty. The Board of Directors, in its business judgment, has determined that Mr. Rose, Dr. Barker and Ms. Cloherty are "independent" in accordance with the provisions of the Securities Exchange Act of 1934, including all rules and regulations promulgated thereunder. The Board of Directors has further determined that Mr. Rose, Dr. Barker and Ms. Cloherty are "independent" in accordance with the applicable listing standards of The Nasdaq Stock Market, Inc. The Board of Directors, in its business judgment, has also determined that Mr. Rose and Ms. Cloherty are "audit committee financial experts" as defined in Item 401(h) of Regulation S-K.

Compensation Committee. Our compensation committee evaluates the performance of management, determines the compensation of our executive officers and reviews general policy relating to compensation and benefits of our employees. The compensation committee also administers the issuance of stock options and other awards under our 2000 Equity Incentive Plan. The current members of the compensation committee are Patricia M. Cloherty (chair), Samuel L. Barker, Ph.D., Frank Palantoni and Clayton S. Rose. The Board of Directors, in its business judgment, has determined that Ms. Cloherty, Dr. Barker, Mr. Palantoni and Mr. Rose are "independent" in accordance with the applicable listing standards of The Nasdaq Stock Market, Inc.

Corporate Governance Committee. Our corporate governance committee identifies individuals qualified to become members of our Board of Directors, selects candidates or nominees for director positions to be filled by the Board of Directors or our stockholders and develops appropriate corporate governance principles. The corporate governance committee operates pursuant to a charter that was approved by the Board of Directors on February 11, 2004, a copy of which appears on our website at www.lexicon-genetics.com under the caption "Investor Relations - Corporate Governance."

The corporate governance committee has not established any specific minimum qualifications for membership on our Board of Directors. Rather, the committee will generally consider all relevant factors, which may include independence, experience, diversity, leadership qualities and strength of character. The corporate governance committee uses its available network of contacts when compiling a list of potential director candidates and may also engage outside consultants when appropriate. The committee also considers potential director candidates recommended by stockholders and other parties and all potential director candidates are evaluated based on the above criteria. Because the corporate governance committee makes no distinction in its evaluation of candidates based on whether such candidates are recommended by stockholders or other parties, no formal policy or procedure has been established for the consideration of director candidates recommended by stockholders.

Any stockholder wishing to propose a potential director candidate may submit a recommendation in writing within the timeframe specified in our bylaws. All such communications should be sent to 8800 Technology Forest Place, The Woodlands, Texas 77381, Attn: Corporate Governance Committee. Submissions should include the full name of the proposed candidate and a detailed description of the candidate's qualifications, business experience and other relevant biographical information.

The current members of the corporate governance committee are Frank Palantoni (chair) and Robert J. Lefkowitz, M.D. The Board of Directors, in its business judgment, has determined that Mr. Palantoni and Dr. Lefkowitz are "independent" in accordance with the applicable listing standards of The Nasdaq Stock Market, Inc.

BOARD AND COMMITTEE MEETINGS IN 2004

The Board of Directors met five times in 2004 and took certain additional actions by unanimous written consent. The audit committee and compensation committee each met four times and the corporate governance committee met two times in 2004. During 2004, none of our directors attended fewer than 75 percent of the aggregate number of meetings of the Board of Directors and committees during the period served.

DIRECTOR COMPENSATION

Each director other than Arthur T. Sands, M.D., Ph.D. currently receives the following cash compensation:

- an annual retainer of \$15,000 for service on the Board of Directors (prorated for any partial year of service);
- an annual retainer of \$2,500 for service on each committee of the Board of Directors of which he or she is a member (prorated for any partial year of service) (\$5,000 for service as chairman of any such committee);
- a fee \$2,500 for each meeting of the Board of Directors that he or she attends in person (\$500 for each telephonic meeting of the Board of Directors in which he or she participates); and
- a fee of \$1,000 for each committee meeting that he or she attends in person (other than in connection with a meeting of the full Board of Directors) (\$500 for each telephonic committee meeting in which he or she participates).

Dr. Sands does not receive additional compensation for his service as a director. Dr. Nies receives payment of \$75,000 per year for his service as Chairman of our Medical Advisory Board. Until March 2005, Dr. Caskey received payment of \$150,000 per year for his service as non-executive Chairman of our Board of Directors. Dr. Caskey currently receives payment of \$75,000 per year for his consulting services. Dr. Lefkowitz receives payment of \$50,000 per year for his consulting services. All directors are reimbursed for expenses in connection with attendance at Board of Directors and committee meetings.

Our 2000 Non-Employee Directors' Stock Option Plan provides for the grant of options to purchase shares of common stock to our directors who are not employees. Non-employee directors first elected after the closing of our initial public offering receive an initial option to purchase 30,000 shares of common stock. In addition, all non-employee directors who have served in such capacity for six months currently receive an annual option to purchase 6,000 shares of common stock. The proposed amendment to the non-employee directors' plan would increase the number of shares underlying the annual option grants from 6,000 shares to 10,000 shares. All options granted under the non-employee directors' plan have an exercise price equal to the fair market value of our common stock on the date of grant.

At the time of our annual meeting of stockholders in May 2004, each of Dr. Caskey, Dr. Barker, Ms. Cloherty, Dr. Lefkowitz and Dr. Nies received options under the 2000 Non-Employee Directors' Stock Option Plan to purchase 6,000 shares of common stock at an exercise price of \$6.84 per share, the fair market value of our common stock on the date of grant as determined in accordance with the plan. In July 2004, in connection with his election as a director, Mr. Rose received an initial option under the 2000 Non-Employee Directors' Stock Option Plan to purchase 30,000 shares of common stock at an exercise price of \$5.92 per share, the fair market value of our common stock on the date of grant as determined in accordance with the plan. In November 2004, in connection with his election as a director, Mr. Palantoni received an initial option under the 2000 Non-Employee Directors' Stock Option Plan to purchase 30,000 shares of

common stock at an exercise price of \$6.79 per share, the fair market value of our common stock on the date of grant as determined in accordance with the plan.

STOCKHOLDER COMMUNICATIONS WITH THE BOARD OF DIRECTORS

We believe that our stockholders are currently provided a reasonable means to communicate with our Board of Directors or individual directors. As a result, our Board of Directors has not established a formal process for stockholders to send communications to the Board of Directors or individual directors. However, the corporate governance committee will consider, from time to time, whether adoption of a formal process for such stockholder communications has become necessary or appropriate. Stockholders may send communications to the Board of Directors or individual directors by mail at 8800 Technology Forest Place, The Woodlands, Texas 77381, Attn: Board of Directors.

CODE OF BUSINESS CONDUCT AND ETHICS

We have adopted a code of business conduct and ethics that applies to all of our directors, officers and employees, the text of which appears on our website at www.lexicon-genetics.com under the caption "Investor Relations - Corporate Governance." We intend to disclose on our website the nature of any amendment to or waiver from our code of business conduct and ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions within five business days following the date of such amendment or waiver. In the case of any such waiver, including an implicit waiver, we also intend to disclose the name of the person to whom the waiver was granted and the date of the waiver.

COMPENSATION COMMITTEE INTERLOCKS AND INSIDER PARTICIPATION

During 2004, Patricia M. Cloherty and Samuel L. Barker, Ph.D. served as members of the compensation committee of our Board of Directors. No member of the compensation committee serves as a member of the board of directors or compensation committee of any other entity that has one or more executive officers serving as a member of our board of directors or compensation committee.

PROPOSAL NUMBER 2: RATIFICATION AND APPROVAL OF AMENDMENT TO 2000 NON-EMPLOYEE DIRECTORS' STOCK OPTION PLAN

We use stock option awards as a part of our overall compensation program in order to align the long-term interests of the non-employee members of our Board of Directors with those of our stockholders. These awards are made under our 2000 Non-Employee Directors' Stock Option Plan, the purpose of which is to secure and retain the services of non-employee directors, and to provide them with incentives to exert maximum efforts for the company's success by giving them the opportunity through the granting of nonstatutory stock options to benefit from increases in the value of our common stock. The plan was adopted by our Board of Directors on February 3, 2000 and approved by our stockholders on March 15, 2000.

The plan currently provides that all non-employee directors who have served in such capacity for six months shall be granted an annual option to purchase 6,000 shares of common stock. We are asking that stockholders ratify and approve an amendment to the plan increasing the number of shares underlying the annual option grants to 10,000 shares so that this portion of our overall compensation program remains competitive in comparison to the compensation programs of our peer group companies.

The terms of the 2000 Non-Employee Directors' Stock Option Plan are summarized below and the complete text of the plan is set forth in Appendix A to this proxy statement, in each case, reflecting the amendment described above.

THE BOARD OF DIRECTORS RECOMMENDS THAT STOCKHOLDERS VOTE "FOR" RATIFICATION AND APPROVAL OF THE AMENDMENT TO THE 2000 NON-EMPLOYEE DIRECTORS' STOCK OPTION PLAN.

ADMINISTRATION OF THE PLAN

The plan is administered by our Board of Directors, which oversees the grant of options under the plan and determines the provisions of each option granted, to the extent not specified in the plan.

AWARDS UNDER THE PLAN

The plan only permits the award of nonstatutory stock options. Stock options granted under the plan are evidenced by agreements that specify the terms and conditions under which they are granted. All stock options granted under the plan are subject to the terms and conditions contained in the applicable agreement and the plan.

ELIGIBILITY

Stock options are granted to non-employee directors under the plan. Upon the date of his or her initial election or appointment to the Board of Directors, each non-employee director is granted an option to purchase 30,000 shares of our common stock. Further, on the day following each annual meeting of stockholders, beginning in 2001, each person who is then a non-employee director and has been a non-employee director for at least six months is granted an option to purchase 10,000 shares of our common stock. Seven of the eight members of our Board of Directors are currently eligible to participate in the plan.

SHARES SUBJECT TO THE PLAN

We have reserved an aggregate of 600,000 shares of our common stock for issuance under the plan. The plan provides that, on the day following the annual meeting of stockholders of each year for ten years, beginning in 2000, the number of shares reserved for issuance under the plan will be automatically increased by the greater of:

- 0.3% of our outstanding shares on a fully-diluted basis; or
- that number of shares that could be issued under stock options granted under the Plan during the prior year.

However, our Board of Directors may provide for a smaller annual increase in the number of shares reserved for issuance under the plan. In each of the last five years, the Board of Directors has limited the number of shares reserved for issuance under the plan to the 600,000 shares initially reserved under the plan.

If any stock option expires, lapses, or is terminated or forfeited for any reason, the shares subject to that stock option will continue to be available for the grant of stock options under the plan. Common stock issued on the exercise of stock options under the plan may be either authorized and unissued shares or reacquired shares.

As of March 1, 2005, there were options outstanding under the plan to purchase a total of 198,000 shares of our common stock and 402,000 shares remained available for issuance of new options. To date, no shares have been issued upon the exercise of options granted under the plan.

STOCK OPTIONS

The stock options granted under the plan are evidenced by agreements that specify the number of shares of our common stock which may be purchased at a certain specified price and contain other terms and conditions, such as vesting and termination provisions. All stock options granted under the plan are subject to the terms and conditions contained in the applicable stock option agreement and the plan.

Vesting and Exercisability

Stock options granted under the plan "vest," or become exercisable, as follows:

- Initial grants of options to purchase 30,000 shares of our common stock provide for vesting of 1/60th of the shares subject to the option each month after grant for five years after the date of grant.
- Annual grants of options to purchase 10,000 shares of our common stock provide for vesting of 1/12th of the shares subject to the option each month after grant for twelve months after the date of the grant.

Expiration and Termination

Stock options granted under the plan have a term of ten years from the date of grant, subject to earlier termination upon the occurrence of certain events. In no event, however, may a stock option be exercised more than ten years after the date the option is granted.

Option Exercise Price

Stock options awarded under the plan have an exercise price of 100% of the fair market value of our common stock on the date of grant. The fair market value of a share of common stock on a particular date is equal to the previous day's closing sales price (or the closing bid price, if no sales were reported) of the common stock if the common stock is listed on any established stock exchange or traded on the Nasdaq Stock Market. If there is no regular public trading market for the common stock, the fair market value of the common stock is determined by our Board of Directors.

Consideration for Exercise of Options

The consideration to be paid for shares to be issued upon exercise of a stock option, including the method of payment, may be paid, to the extent permitted by law, in any combination of (1) cash or (2) delivery of other shares of our common stock (which must have been held at least six months).

OTHER PROVISIONS

Limits on Transfer of Stock Options

In general, non-employee directors may not sell, pledge, assign, transfer or otherwise dispose of any stock options other than (i) by will or the laws of descent or distribution, (ii) in certain circumstances, by instrument to an inter vivos or testamentary trust and (iii) by gift to a member of such non-employee director's immediate family.

Adjustments on Changes in Capital Structure or on Change of Control

If we effect a stock split, reverse stock split, stock dividend, redemption, combination, reclassification or other similar change affecting our capital stock, adjustments reflecting the change will be made in (1) the aggregate number of shares of common stock authorized for issuance under the plan; (2) the number of shares underlying each outstanding stock option; and (3) the exercise price per share subject to each outstanding stock option.

If a change in control transaction shall occur, the surviving or acquiring corporation shall assume all stock options or provide or substitute similar stock options. If the surviving or acquiring corporation refuses to so provide such assumption or substitution, then the vesting of stock options granted under the plan will be accelerated in full and the stock options will subsequently terminate if not exercised.

If a change in control transaction shall occur and the surviving or acquiring corporation assumes the stock options granted under the plan, but any non-employee director is not elected or appointed to the Board of Directors of the surviving or acquiring corporation, then the vesting of that non-employee director's stock options shall be accelerated by 18 months.

Amendment or Termination of the Plan

The Board of Directors may at any time amend, alter, suspend or discontinue the plan but no amendment, alteration, suspension or discontinuation which would impair the rights of a non-employee director under any previous grant may be made without such non-employee director's consent.

Term of the Plan

No stock options may be granted under the plan after February 3, 2010.

UNITED STATES FEDERAL INCOME TAX CONSEQUENCES

The following is a brief summary of certain of the federal income tax consequences of certain transactions under the plan based on current federal income tax laws. This summary is not intended to be exhaustive and does not describe state or local tax consequences. Additional or different federal tax consequences to the non-employee director or to us may result depending on considerations other than those described below.

In general, optionholders will not recognize any taxable income at the time they are granted a nonstatutory stock option. When an optionholder exercises a nonstatutory stock option, he or she will recognize ordinary income measured by the excess of the then fair market value of the shares over the exercise price and we will be entitled to a deduction for a corresponding amount. Different rules apply to options that have a "readily ascertainable fair market value," as that phrase is defined in regulations promulgated under Section 83 of the Internal Revenue Code of 1986.

When an optionholder sells or otherwise disposes of shares that were acquired by exercising a nonstatutory stock option, any amount the optionholder receives in excess of the sum of (1) the exercise price of the shares as of the date of exercise and (2) the amount includable in income with respect to such option, if any, such sum being the optionholder's "basis" in the shares, will, in general, be treated as a long term or short term capital gain, depending on the holding period of the shares. We are not entitled to any tax deduction in connection with an optionholder's sale or disposition of the shares. If an optionholder receives less than his or her basis in the shares, the loss will, in general, be treated as a long term or short term capital loss, depending on the holding period of the shares.

The foregoing summary does not constitute a definitive statement of the federal income tax effects of stock options granted under the plan.

PROPOSAL NUMBER 3:
RATIFICATION AND APPROVAL OF INDEPENDENT AUDITORS

The Board of Directors has appointed the firm of Ernst & Young LLP as our independent auditors to make an examination of our accounts for the fiscal year ending December 31, 2005, subject to ratification by our stockholders. Representatives of Ernst & Young LLP, are expected to be present at the annual meeting, will have an 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 THAT STOCKHOLDERS VOTE "FOR" RATIFICATION AND APPROVAL OF THE APPOINTMENT OF ERNST & YOUNG LLP AS OUR INDEPENDENT AUDITORS FOR THE FISCAL YEAR ENDING DECEMBER 31, 2005.

COMPENSATION OF INDEPENDENT AUDITORS

The following table presents the estimated aggregate fees billed and to be billed by Ernst & Young LLP for services performed during our last two fiscal years.

	YEARS ENDED DECEMBER 31,	
	2004	2003
Audit fees(1).....	\$ 300,322	\$ 194,180
Audit-related fees(2)	45,326	40,255
Tax fees(3).....	30,660	33,800
All other fees(4).....	375	--
	-----	-----
	\$ 376,683	\$ 268,235
	=====	=====

(1) "Audit fees" include professional services rendered for (i) the audit of our management's assessment of effective internal control over financial reporting for the fiscal year ended December 31, 2004, (ii) the audit of our annual financial statements for the fiscal years ended December 31, 2003 and 2004, (iii) the reviews of the financial statements included in our quarterly reports on Form 10-Q for such years and (iv) the issuance of consents and other matters relating to registration statements filed by us.

(2) "Audit-related fees" include assurance or related services reasonably related to our audit for the fiscal years ended December 31, 2003 and 2004. These fees related to the audit of the financial statements of our 401(k) plan and consultation concerning financial accounting and reporting standards.

- (3) "Tax fees" include professional services related to the preparation of our tax returns, tax planning and other tax advice for the fiscal years ended December 31, 2003 and 2004.
- (4) "All other fees" include products and services other than those disclosed as Audit fees, Audit-related fees and Tax fees.

The audit committee approved all the fees described above. As part of its duties, the audit committee has determined that the provision by Ernst & Young LLP of the non-audit services described above is compatible with maintaining the auditors' independence.

Pre-Approval Policies and Procedures

The audit committee has adopted policies and procedures requiring the pre-approval of all audit and non-audit services rendered by our independent auditors, either as part of the audit committee's approval of the scope of the engagement of the independent auditors or on a case-by-case basis before the independent auditors are engaged to provide each service. The audit committee's pre-approval authority may be delegated to one or more of its members, but any pre-approval decision must be reported to the full audit committee at its next regularly scheduled meeting.

REPORT OF THE AUDIT COMMITTEE OF THE BOARD OF DIRECTORS

The role of the audit committee is to assist the Board of Directors in its oversight of our financial reporting process. The audit committee reviews our internal accounting procedures and consults with, and reviews the services provided by, our independent auditors. The committee operates pursuant to a charter that was last amended and restated by the Board of Directors on February 11, 2004.

The management of our company is responsible for the preparation, presentation and integrity of our financial statements, our accounting and financial reporting principles and internal controls and procedures designed to assure compliance with the accounting standards and applicable laws and regulations. Our independent auditors are responsible for auditing our financial statements and expressing an opinion as to their conformity with generally accepted accounting principles.

In the performance of its oversight function, the audit committee has considered and discussed the audited financial statements with management and our independent auditors. The committee has also discussed with our independent auditors the matters required to be discussed by Statement on Auditing Standards No. 61, Communication with Audit Committees, as currently in effect. Finally, the committee has received the written disclosures and the letter from the independent auditors required by Independence Standards Board Standard No. 1, Independence Discussions with Audit Committees, as currently in effect, and has discussed with the independent auditors their independence.

Based upon the reports and discussions described in this report, and subject to the limitations on the role and responsibilities of the audit committee referred to in the audit committee charter, the committee recommended to the Board of Directors that the audited financial statements be included in our annual report on Form 10-K for the year ended December 31, 2004.

AUDIT COMMITTEE

Samuel L. Barker, Ph.D.
Patricia M. Cloherty
Clayton S. Rose

The foregoing report of the audit committee shall not be deemed incorporated by reference by any general statement incorporating by reference this proxy statement into any filing under the Securities Act of 1933 or under the Securities Exchange Act of 1934, except to the extent that we specifically incorporate this information by reference, and shall not otherwise be deemed filed under such acts.

EXECUTIVE COMPENSATION

EXECUTIVE OFFICERS

The executive officers of the Company and their ages and positions are listed below.

NAME	AGE	POSITION WITH THE COMPANY
Arthur T. Sands, M.D., Ph.D.	43	President and Chief Executive Officer and Director
Julia P. Gregory	52	Executive Vice President, Corporate Development and Chief Financial Officer
Jeffrey L. Wade, J.D.	40	Executive Vice President and General Counsel
Brian P. Zambrowicz, Ph.D.	42	Executive Vice President of Research
Walter F. Colbert	55	Senior Vice President of Human Resources and Corporate Services
Lance K. Ishimoto, Ph.D., J.D.	45	Senior Vice President of Intellectual Property
Alan J. Main, Ph.D.	51	Senior Vice President, Lexicon Pharmaceuticals
James R. Piggott, Ph.D.	50	Senior Vice President of Pharmaceutical Biology

Information regarding the business experience of Dr. Sands is set forth above under the heading "Election of Directors -- Current and Continuing Directors."

Julia P. Gregory has been our Executive Vice President, Corporate Development and Chief Financial Officer since August 2003 and served as our Executive Vice President and Chief Financial Officer from February 2000 until August 2003. From 1998 to February 2000, Ms. Gregory served as the Head of Investment Banking for Punk, Ziegel & Company, a specialty investment banking firm focusing on technology and healthcare and, from 1996 to February 2000, as the Head of the firm's Life Sciences practice. From 1980 to 1996, Ms. Gregory was an investment banker, primarily with Dillon, Read & Co., Inc., where she represented life sciences companies beginning in 1986. Ms. Gregory is a member of the board of directors and the scientific advisory board of the Estee Lauder Foundation's Institute for the Study of Aging, Inc. and a member of The International Council for George Washington University's Elliott School of International Affairs. She received her B.A. in International Affairs from George Washington University and her M.B.A. from the Wharton School of the University of Pennsylvania.

Jeffrey L. Wade, J.D. has been our Executive Vice President and General Counsel since February 2000 and was our Senior Vice President and Chief Financial Officer from January 1999 to February 2000. From 1988 through December 1998, Mr. Wade was a corporate securities and finance attorney with the law firm of Andrews & Kurth L.L.P., for the last two years as a partner, where he represented companies in the biotechnology, information technology and energy industries. Mr. Wade is a member of the boards of directors of the Texas Healthcare and Bioscience Institute and the Texas Life Sciences Foundation. He received his B.A. and J.D. from The University of Texas.

Brian P. Zambrowicz, Ph.D. co-founded our company and has been our Executive Vice President of Research since August 2002. Dr. Zambrowicz served as our Senior Vice President of Genomics from February 2000 to August 2002, Vice President of Research from January 1998 to February 2000 and Senior Scientist from April 1996 to January 1998. From 1993 to April 1996, Dr. Zambrowicz served as a National Institutes of Health, or NIH, postdoctoral fellow at The Fred Hutchinson Cancer Center in Seattle, Washington, where he studied gene trapping and gene targeting technology. Dr. Zambrowicz received his B.S. in Biochemistry from the University of Wisconsin. He received his Ph.D. from the University of Washington, where he studied tissue-specific gene regulation using transgenic mice.

Walter F. Colbert has been our Senior Vice President of Human Resources and Corporate Services since May 2002. Mr. Colbert served as our Vice President of Human Resources from December 2000 to May 2002. From September 1997 to December 2000, Mr. Colbert was Vice President, Human Resources and Public Affairs at the Sony Technology Center -- San Diego of Sony Electronics Inc. From September 1995 to September 1997, Mr. Colbert served as Vice President, Human Resources for The NutraSweet Kelco Company, Monsanto Company's food ingredients business unit. From 1976 through September 1995, Mr. Colbert served in a variety of human resources positions in the United States and Europe with Ford Motor Company and Monsanto Company. He received his B.A. in Political Science

from Stanford University and his M.A. in International Affairs from The Fletcher School of Law and Diplomacy at Tufts University.

Lance K. Ishimoto, J.D., Ph.D. has been our Senior Vice President of Intellectual Property since February 2004. Dr. Ishimoto served as our Vice President of Intellectual Property from July 1998 to February 2004. From 1994 to July 1998, Dr. Ishimoto was a biotechnology patent attorney at the Palo Alto, California office of the law firm of Pennie & Edmonds LLP. Dr. Ishimoto received his B.A. and Ph.D. from the University of California at Los Angeles, where he studied molecular mechanisms of virus assembly and the regulation of virus ultrastructure. After receiving his Ph.D., Dr. Ishimoto served as an NIH postdoctoral fellow at University of Washington School of Medicine. He received his J.D. from Stanford University.

Alan J. Main, Ph.D. has been our Senior Vice President, Lexicon Pharmaceuticals since July 2001. Dr. Main was President and Chief Executive Officer of Coelacanth Corporation, a leader in using proprietary chemistry technologies to rapidly discover new chemical entities for drug development, from January 2000 until our acquisition of Coelacanth in July 2001. Dr. Main was formerly Senior Vice President, United States Research at Novartis Pharmaceuticals Corporation, where he worked for 20 years before joining Coelacanth. Dr. Main holds a B.S. from the University of Aberdeen, Scotland and a Ph.D. in Organic Chemistry from the University of Liverpool, England and completed postdoctoral studies at the Woodward Research Institute.

James R. Piggott, Ph.D. has been our Senior Vice President of Pharmaceutical Biology since January 2000. From 1990 through October 1999, Dr. Piggott worked for ZymoGenetics, Inc., a subsidiary of Novo Nordisk, a company focused on the discovery, development and commercialization of therapeutic proteins for the treatment of human disease, most recently as Senior Vice President-Research Biology from 1997 to October 1999. Dr. Piggott's pharmaceutical research experience also includes service at the Smith Kline & French Laboratories Ltd. unit of SmithKline Beecham plc and the G.D. Searle & Co. unit of Monsanto Company. Dr. Piggott received his B.A. and Ph.D. from Trinity College, Dublin.

SUMMARY COMPENSATION TABLE

The following table presents summary information for the years ended December 31, 2004, 2003 and 2002 regarding the compensation of each of our five most highly compensated executive officers.

NAME AND POSITION	YEAR	LONG-TERM COMPENSATION AWARDS			SECURITIES UNDERLYING ALL OTHER OPTIONS	COMPENSATION(1)
		ANNUAL COMPENSATION	SALARY	BONUS		
Arthur T. Sands, M.D., Ph.D. (2)	2004	\$ 469,583	\$ 205,244	150,000	\$ 5,914	
President, Chief Executive Officer and Director	2003	\$ 432,000	\$ 309,536	135,000	\$ 6,022	
	2002	\$ 429,333	\$ 243,675	170,000	\$ 5,600	
Julia P. Gregory	2004	\$ 327,417	\$ 98,891	75,000	\$ 5,675	
Executive Vice President, Corporate Development and Chief Financial Officer	2003	\$ 286,000	\$ 126,215	72,000	\$ 5,711	
	2002	\$ 283,833	\$ 86,800	90,000	\$ 5,600	
Jeffrey L. Wade, J.D.	2004	\$ 289,854	\$ 79,190	60,000	\$ 5,612	
Executive Vice President and General Counsel	2003	\$ 266,250	\$ 100,630	54,000	\$ 5,631	
	2002	\$ 264,896	\$ 70,100	65,000	\$ 5,600	
Brian P. Zambrowicz, Ph.D.	2004	\$ 309,750	\$ 102,665	70,000	\$ 5,645	
Executive Vice President of Research	2003	\$ 285,000	\$ 109,140	63,000	\$ 5,674	
	2002	\$ 276,858	\$ 80,200	75,000	\$ 5,600	
Alan J. Main, Ph.D. (3)	2004	\$ 310,754	\$ 80,384	50,000	\$ 5,647	
Senior Vice President, Lexicon Pharmaceuticals	2003	\$ 297,045	\$ 83,780	54,000	\$ 5,674	
	2002	\$ 296,208	\$ 186,700	15,000	\$ 5,440	

(1) Other compensation during 2004, 2003 and 2002 includes the following amounts in respect of company matching contributions under our 401(k) plan and company-paid premiums for group term life insurance. The company-paid life insurance premiums reflect payments for group term life policies maintained for the benefit of all employees.

YEAR	COMPANY-PAID		
	COMPANY 401(K) MATCHING CONTRIBUTION	GROUP TERM LIFE INSURANCE PREMIUMS	
Arthur T. Sands, M.D., Ph.D.	2004	\$ 5,125	\$ 789
	2003	\$ 5,000	\$ 1,022
	2002	\$ 5,000	\$ 600
Julia P. Gregory	2004	\$ 5,125	\$ 550
	2003	\$ 5,000	\$ 711
	2002	\$ 5,000	\$ 600
Jeffrey L. Wade, J.D.	2004	\$ 5,125	\$ 487
	2003	\$ 5,000	\$ 631
	2002	\$ 5,000	\$ 600
Brian P. Zambrowicz, Ph.D.	2004	\$ 5,125	\$ 520
	2003	\$ 5,000	\$ 674
	2002	\$ 5,000	\$ 600
Alan J. Main, Ph.D.	2004	\$ 5,125	\$ 522
	2003	\$ 5,000	\$ 674
	2002	\$ 5,000	\$ 440

(2) The amount reflected as bonus compensation for Dr. Sands in 2003 and 2002 includes bonus payments to Dr. Sands of \$59,706 and \$61,375, respectively, to enable him to make, for his own account, the minimum premium payments required for him to maintain the split-dollar life insurance arrangement under his employment agreement with us. We will not receive any cash under the policy upon Dr. Sands' death in respect of such bonus amounts or the premiums paid by Dr. Sands, for his own account, under such policy.

(3) Dr. Main joined us in July 2001 in connection with our acquisition of Coelacanth Corporation. The amount reflected as bonus compensation for Dr. Main in 2002 includes a retention bonus payment in the amount of \$125,000 under an arrangement entered into in connection with our acquisition of Coelacanth Corporation.

OPTION GRANTS IN 2004

The following table presents each grant of stock options in 2004 to the individuals named in the summary compensation table.

NAME	NUMBER OF UNDERLYING SECURITIES GRANTED	PERCENTAGE OF TOTAL OPTIONS GRANTED TO EMPLOYEES IN 2004	EXERCISE PRICE PER SHARE	POTENTIAL REALIZABLE VALUE AT ASSUMED ANNUAL RATES OF STOCK PRICE APPRECIATION FOR OPTION TERM	EXPIRATION DATE	
					5%	10%
Arthur T. Sands, M.D., Ph.D.	150,000	8.1%	\$ 7.59	2/12/2014	\$ 715,997	\$ 1,814,476
Julia P. Gregory	75,000	4.1%	\$ 7.59	2/12/2014	\$ 357,998	\$ 907,238
Jeffrey L. Wade, J.D.	60,000	3.3%	\$ 7.59	2/12/2014	\$ 286,399	\$ 725,790
Brian P. Zambrowicz, Ph.D.	70,000	3.8%	\$ 7.59	2/12/2014	\$ 334,132	\$ 846,755
Alan J. Main, Ph.D.	50,000	2.7%	\$ 7.59	2/12/2014	\$ 238,666	\$ 604,825

The exercise price of each of the options in the foregoing table was equal to the fair market value of our common stock as determined by our Board of Directors on the date of grant. The exercise price for each option may be paid in cash, promissory notes, in shares of our common stock valued at fair market value on the exercise date or through a cashless exercise procedure involving a same-day sale of the purchased shares.

The potential realizable value of these options is calculated based on the ten-year term of the option at the time of grant. Stock price appreciation of 5% and 10% is assumed pursuant to rules promulgated by the Securities and Exchange Commission and does not represent our prediction of our stock price performance.

Percentages shown under "Percentage of Total Options Granted to Employees

in 2004" are based on an aggregate of 1,844,500 options granted to our employees under our 2000 Equity Incentive Plan during 2004.

AGGREGATED OPTION EXERCISES IN 2004 AND OPTION VALUES AT DECEMBER 31, 2004

The following table presents information about:

- option exercises in 2004 by each of the individuals listed in the summary compensation table; and
- the number and value of the shares of common stock underlying unexercised options that are held by each of the individuals listed in the summary compensation table as of December 31, 2004.

Amounts shown under the column "Value Realized" are based on the market price of our common stock on the date of exercise, without taking into account any taxes that may be payable in connection with the transaction, less the exercise price paid for the purchased shares.

Amounts shown under the column "Value of Unexercised In-the-Money Options at December 31, 2004" are based on the closing price of our common stock on The Nasdaq National Market on December 31, 2004 of \$7.76 per share, without taking into account any taxes that may be payable in connection with the transaction, less the exercise price payable for these shares.

NAME	SHARES ACQUIRED ON	VALUE EXERCISE	NUMBER OF SECURITIES UNDERLYING UNEXERCISED OPTIONS AT		VALUE OF UNEXERCISED IN-THE-MONEY OPTIONS AT	
			DECEMBER 31, 2004	DECEMBER 31, 2004	UNEXERCISABLE	EXERCISABLE
Arthur T. Sands, M.D., Ph.D.	--	--	2,715,681	276,819	\$ 15,016,157	\$ 307,728
Julia P. Gregory	52,000	\$211,100	587,280	142,720	\$ 2,404,975	\$ 163,275
Jeffrey L. Wade, J.D.	--	--	626,232	110,268	\$ 2,764,997	\$ 123,093
Brian P. Zambrowicz, Ph.D.	--	--	1,004,943	128,057	\$ 5,005,256	\$ 143,607
Alan J. Main, Ph.D.	--	--	362,535	105,466	\$ 379,262	\$ 121,393

EMPLOYMENT AGREEMENTS

In October 1999, we entered into an employment agreement with Arthur T. Sands, M.D., Ph.D., our President and Chief Executive Officer. Under the agreement, Dr. Sands receives a base salary, currently \$473,000 a year, subject to adjustment, with an annual discretionary bonus based upon specific objectives to be determined by the compensation committee. The employment agreement is at-will and contains a non-competition agreement. The agreement also provides that if we terminate Dr. Sands' employment without cause or Dr. Sands voluntarily terminates his employment for good reason, we will pay him his then-current salary for 12 months.

In February 2000, we entered into an employment agreement with Julia P. Gregory to serve as our Executive Vice President and Chief Financial Officer starting in February 2000. In August 2003, Ms. Gregory was named Executive Vice President, Corporate Development and Chief Financial Officer. Under the agreement, Ms. Gregory receives a base salary, currently \$329,000 a year, subject to adjustment, with an annual discretionary bonus based upon specific objectives to be determined by the compensation committee. The employment agreement is at-will and contains a non-competition agreement. The agreement also provides that if we terminate Ms. Gregory's employment without cause or Ms. Gregory voluntarily terminates her employment for good reason, we will pay her then-current salary for six months. If any such termination follows a change in control of our company, we will pay Ms. Gregory her then-current salary for 12 months.

In December 1998, we entered into an employment agreement with Jeffrey L. Wade, J.D. to serve as our Senior Vice President and Chief Financial Officer starting in January 1999. In February 2000, Mr. Wade was named Executive Vice President and General Counsel. Under the agreement, Mr. Wade receives a base salary, currently \$292,000 a year, subject to adjustment, with an annual discretionary bonus based upon specific objectives to be determined by the compensation committee. The employment agreement is at-will and contains a non-competition agreement. The agreement also provides that if we terminate Mr. Wade's employment without cause or Mr. Wade voluntarily terminates his employment for good reason, we will pay him his then-current salary for six months. If any such termination follows a change in control of our company, we will pay Mr. Wade his then-current salary for 12 months.

In February 2000, we entered into an employment agreement with Brian P. Zambrowicz, Ph.D., then our Senior Vice President of Genomics. In August 2002, Dr. Zambrowicz was named Executive Vice President of Research. Under the agreement, Dr. Zambrowicz receives a base salary, currently \$312,000 a year, subject to adjustment, with an annual discretionary bonus based upon specific objectives to be determined by the compensation committee. The employment agreement is at-will and contains a non-competition agreement. The agreement also provides that if we terminate Dr. Zambrowicz's employment without cause or Dr. Zambrowicz voluntarily terminates his employment for good reason, we will pay him his then-current salary for six months. If any such termination follows a change in control of our company, we will pay Dr. Zambrowicz his then-current salary for 12 months.

In July 2001, we entered into an employment agreement with Alan J. Main, Ph.D., our Senior Vice President, Lexicon Pharmaceuticals. Under the agreement, Dr. Main receives a base salary, currently \$312,000 a year, subject to adjustment, with an annual discretionary bonus based upon specific objectives to be determined by the compensation committee. The employment agreement is at-will and contains a non-competition agreement. The agreement also provides that if we terminate Dr. Main's employment without cause or Dr. Main voluntarily terminates his employment for good reason, we will pay him his then-current salary for six months. If any such termination follows a change in control of our company, we will pay Dr. Main his then-current salary for 12 months.

REPORT OF THE COMPENSATION COMMITTEE OF THE BOARD OF DIRECTORS

The compensation committee of our Board of Directors currently consists of Patricia M. Cloherty, Samuel L. Barker, Ph.D., Frank Palantoni and Clayton S. Rose, none of whom is an officer or employee of the company.

The compensation committee is responsible for evaluating the performance of management, determining the compensation of our executive officers and administering our 2000 Equity Incentive Plan, under which stock option grants and other stock awards may be made to our employees. The committee has furnished the following report on executive compensation for 2004:

Executive Compensation Policies and Practices

Under the supervision of the compensation committee, our company has developed a compensation policy that is designed to attract and retain key executives responsible for our success and motivate management to enhance long-term stockholder value. The annual compensation package for executive officers primarily consists of:

- a cash salary, which reflects the responsibilities relating to the position and individual performance;
- variable performance awards payable in cash or stock and tied to the achievement of specified individual and corporate goals and milestones; and
- long-term stock based incentive awards which strengthen the mutuality of interests between our executive officers and our stockholders.

In determining the level and composition of compensation of each of our executive officers, the compensation committee takes into account various qualitative and quantitative indicators of corporate and individual performance. Although no specific target has been established, the committee generally seeks to set total compensation, including base salaries and variable performance award targets, at or above the median of the range in comparison to peer group companies. In setting such total compensation, the committee considers our peer group to be similarly sized companies in the biotechnology industry. This peer group does not necessarily coincide with the companies comprising the Nasdaq Biotechnology Index reflected in the performance graph in this proxy statement. Because our business and technology are continuing to develop, the use of certain traditional performance standards, such as profitability and return on equity, are not currently appropriate in evaluating the performance of our executive officers. Consequently, in evaluating the performance of management, the committee takes into consideration such factors as our achievement of specified milestones and goals with respect to our revenues, new business development, and our research and development programs. In addition, the committee recognizes performance and achievements that are more difficult to quantify, such as the successful supervision of major corporate projects and demonstrated leadership ability.

Base Compensation

Base compensation is established through negotiation between the company and the executive officer at the time the executive is hired, and then subsequently adjusted when the officer's base compensation is subject to review or reconsideration. While we have entered into employment agreements with certain of our executive officers, these agreements provide that base salaries after the initial year will be reviewed and determined by the committee. When establishing or reviewing base compensation levels for executive officers, the committee, in accordance with its general compensation policy, considers numerous factors, including the responsibilities relating to the position, the qualifications of the executive and the relevant experience the individual brings to the company, strategic goals for which the executive has responsibility, and compensation levels of companies at a comparable stage of development who compete with us for business, scientific and executive talents. No pre-determined weights are given to any one of these factors. The base salaries for the executive officers generally, and the Chief Executive Officer specifically, for 2004 were competitive with those paid by our peer group companies, with most falling in a range around the 50th to 75th percentile for such peer group companies. In establishing base compensation for 2004, the committee included in its evaluation the significant progress made by the company in 2003, including the significant increase in our revenues as compared to 2002, the establishment of a major new drug discovery alliance with Bristol-Myers Squibb Company, the completion of a significant public offering of our common stock and the continuing advancement of our research and development programs.

Incentive Compensation

In addition to base compensation, the committee may award cash bonuses and option grants or other stock-based awards under our 2000 Equity Incentive Plan to chosen executive officers depending on the extent to which certain defined personal and corporate performance goals are achieved. These performance goals include those discussed generally above, as well as strategic and operational goals for the company as a whole. In determining bonus and stock option awards for 2004, the committee included in its evaluation the progress made by the company in 2004, including the advancement of two drug discovery programs into preclinical development, the significant increase in our revenues as compared to 2003, the establishment of our drug discovery alliance with Takeda Pharmaceutical Company Limited, our execution and performance under our existing drug discovery alliances with Bristol Myers Squibb Company and Genentech, Inc. and the continuing advancement of our other research and development programs.

All of our employees, including our executive officers, are eligible to receive long-term stock-based incentive awards under our 2000 Equity Incentive Plan as a means of providing such individuals with a continuing proprietary interest in our success. These grants align the interests of our employees and our stockholders by providing significant incentives for our employees to achieve and maintain high levels of performance. Our 2000 Equity Incentive Plan enhances our ability to attract and retain the services of qualified individuals. Factors considered in determining whether such awards are granted to an executive officer include the executive's position, his or her performance and responsibilities, the amount of stock options currently held by the officer, the vesting schedules of any such options and the executive officer's other compensation. While the committee does not adhere to any firmly established formulas or schedules for the issuance of awards such as options or restricted stock, the committee will generally tailor the terms of any such grant to achieve its goal as a long-term incentive award by providing for a vesting schedule encompassing several years.

In February 2004, the committee approved annual stock option grants to executive officers and other employees who satisfied eligibility requirements, including time of service. In making such grants, the committee considered corporate and individual performance over the year preceding the grant date and information regarding stock option grants made by other companies in the biotechnology industry.

Compensation of the Chief Executive Officer

The annual base salary of Arthur T. Sands, M.D., Ph.D., our President and Chief Executive Officer, was \$432,000 for 2003, unchanged from 2002. In February 2004, the committee increased Dr. Sands' base salary by \$41,000 (or approximately nine percent) to \$473,000 and awarded a bonus to Dr. Sands for 2003 in the amount of \$249,830, in each case on the basis of his and the company's achievements in 2003 relative to performance goals established at the outset of the year. In February 2005, the committee awarded a bonus to Dr. Sands for 2004 in the amount of \$205,244 on

the basis of his and the company's achievements in 2004 relative to performance goals established at the outset of the year. At the same time, the committee elected to leave Dr. Sands' annual base salary for 2005 unchanged from 2004.

The committee granted a stock option to Dr. Sands in February 2004, at the same time annual grants were made to other employees. The stock option entitles Dr. Sands to purchase an aggregate of 150,000 shares of common stock at an exercise price of \$7.59 per share. In making the option grant to Dr. Sands, the committee considered the factors described above with respect to the February 2004 option grants generally.

Section 162(m)

Section 162(m) of the Internal Revenue Code places a \$1 million cap per executive on the deductible compensation that can be paid to certain executives of publicly-traded corporations. Amounts that qualify as "performance based" compensation under Section 162(m)(4)(c) of the Code are exempt from the cap and do not count toward the \$1 million limit. Generally, stock options will qualify as performance based compensation. The committee has discussed and considered and will continue to evaluate the potential impact of Section 162(m) on the company in making compensation determinations, but has not established a set policy with respect to future compensation determinations.

COMPENSATION COMMITTEE

Patricia M. Cloherty
 Samuel L. Barker, Ph.D.
 Frank Palantoni
 Clayton S. Rose

The foregoing report of the compensation committee shall not be deemed incorporated by reference by any general statement incorporating by reference this proxy statement into any filing under the Securities Act of 1933 or under the Securities Exchange Act of 1934, except to the extent that we specifically incorporate this information by reference, and shall not otherwise be deemed filed under such acts.

PERFORMANCE GRAPH

The following performance graph compares the performance of our common stock to the Nasdaq Composite Index and the Nasdaq Biotechnology Index for the period beginning April 7, 2000, the date of our initial public offering, and ending December 31, 2004. The graph assumes that the value of the investment in our common stock and each index was \$100 at April 7, 2000, and that all dividends were reinvested.

[PERFORMANCE GRAPH]

	APRIL 7, 2000	DECEMBER 31, 2000	DECEMBER 31, 2001	DECEMBER 31, 2002	DECEMBER 31, 2003	DECEMBER 31, 2004
Lexicon Genetics Incorporated	100	76	52	22	27	35
Nasdaq Composite Index	100	56	44	30	45	49
Nasdaq Biotechnology Index	100	96	81	44	64	68

The foregoing stock price performance comparisons shall not be deemed incorporated by reference by any general statement incorporating by reference this proxy statement into any filing under the Securities Act of 1933 or under the Securities Exchange Act of 1934, except to the extent that we specifically incorporate such comparisons by reference, and shall not otherwise be deemed filed under such acts.

PROPOSALS OF STOCKHOLDERS

In order for a stockholder proposal to be considered for inclusion in our proxy statement for next year's annual meeting, we must receive the written proposal at our principal executive offices no later than November 28, 2005. Any such proposal must also comply with Securities and Exchange Commission regulations regarding the inclusion of stockholder proposals in company-sponsored proxy materials. Similarly, in order for any stockholder proposal to be otherwise raised during next year's annual meeting, we must receive written notice of the proposal, containing the information required by our Bylaws, at our principal executive offices no later than November 28, 2005. You may contact the Corporate Secretary at our principal executive offices for a copy of the relevant Bylaw provisions for making stockholder proposals.

FINANCIAL INFORMATION

Our annual report to stockholders, including financial statements, accompanies this proxy statement but does not constitute a part of the proxy solicitation materials. YOU MAY OBTAIN, WITHOUT CHARGE, A COPY OF OUR ANNUAL REPORT ON FORM 10-K, INCLUDING THE FINANCIAL STATEMENTS AND EXHIBITS THERETO, BY WRITTEN REQUEST TO CORPORATE COMMUNICATIONS, LEXICON GENETICS INCORPORATED, 8800 TECHNOLOGY FOREST PLACE, THE WOODLANDS, TEXAS 77381.

By Order of the Board of Directors,

/s/ Jeffrey L. Wade

Jeffrey L. Wade
Secretary

March 28, 2005
The Woodlands, Texas

APPENDIX A

LEXICON GENETICS INCORPORATED
2000 NON-EMPLOYEE DIRECTORS' STOCK OPTION PLAN

(RESTATED TO REFLECT SPLIT PRIOR TO IPO)

1. PURPOSES.

(a) ELIGIBLE OPTION RECIPIENTS. The persons eligible to receive Options are the Non-Employee Directors of the Company.

(b) AVAILABLE OPTIONS. The purpose of the Plan is to provide a means by which Non-Employee Directors may be given an opportunity to benefit from increases in value of the Common Stock through the granting of Nonstatutory Stock Options.

(c) GENERAL PURPOSE. The Company, by means of the Plan, seeks to retain the services of its Non-Employee Directors, to secure and retain the services of new Non-Employee Directors and to provide incentives for such persons to exert maximum efforts for the success of the Company and its Affiliates.

2. DEFINITIONS.

(a) "AFFILIATE" means any parent corporation or subsidiary corporation of the Company, whether now or hereafter existing, as those terms are defined in Sections 424(e) and (f), respectively, of the Code.

(b) "ANNUAL GRANT" means an Option granted annually to all Non-Employee Directors who meet the specified criteria pursuant to subsection 6(b) of the Plan.

(c) "ANNUAL MEETING" means the annual meeting of the stockholders of the Company.

(d) "BOARD" means the Board of Directors of the Company.

(e) "CODE" means the Internal Revenue Code of 1986, as amended.

(f) "COMMON STOCK" means the common stock, par value \$.001 per share, of the Company.

(g) "COMPANY" means Lexicon Genetics Incorporated, a Delaware corporation.

(h) "CONSULTANT" means any person, including an advisor, (i) engaged by the Company or an Affiliate to render consulting or advisory services and who is compensated for such services or (ii) who is a member of the Board of Directors of an Affiliate. However, the term "Consultant" shall not include either Directors of the Company who are not compensated by the Company for their services as Directors or Directors of the Company who are merely paid a director's fee by the Company for their services as Directors.

(i) "CONTINUOUS SERVICE" means that the Optionholder's service with the Company or an Affiliate, whether as an Employee, Director or Consultant, is not interrupted or terminated. The Optionholder's Continuous Service shall not be deemed to have terminated merely because of a change in the capacity in which the Optionholder renders service to the Company or an Affiliate as an Employee, Consultant or Director or a change in the entity for which the Optionholder renders such service, provided that there is no interruption or termination of the Optionholder's Continuous Service. For example, a change in status from a Non-Employee Director of the Company to a Consultant of an Affiliate or an Employee of the Company will not constitute an interruption of Continuous Service. The Board or the chief executive officer of the Company, in that party's sole discretion, may determine whether Continuous Service shall be considered interrupted in the case of any leave of absence approved by that party, including sick leave, military leave or any other personal leave.

APPENDIX A

- (j) "DIRECTOR" means a member of the Board of Directors of the Company.
- (k) "DISABILITY" means the permanent and total disability of a person within the meaning of Section 22(e)(3) of the Code.
- (l) "EMPLOYEE" means any person employed by the Company or an Affiliate. Mere service as a Director or payment of a director's fee by the Company or an Affiliate shall not be sufficient to constitute "employment" by the Company or an Affiliate.
- (m) "EXCHANGE ACT" means the Securities Exchange Act of 1934, as amended.
- (n) "FAIR MARKET VALUE" means, as of any date, the value of the Common Stock determined as follows:
- (i) If the Common Stock is listed on any established stock exchange or traded on the Nasdaq National Market or the Nasdaq SmallCap Market, the Fair Market Value of a share of Common Stock shall be the closing sales price for such stock (or the closing bid, if no sales were reported) as quoted on such exchange or market (or the exchange or market with the greatest volume of trading in the Common Stock) on the last market trading day prior to the day of determination, as reported in The Wall Street Journal or such other source as the Board deems reliable.
 - (ii) In the absence of such markets for the Common Stock, the Fair Market Value shall be determined in good faith by the Board.
- (o) "INITIAL GRANT" means an Option granted to a Non-Employee Director who meets the specified criteria pursuant to subsection 6(a) of the Plan.
- (p) "IPO DATE" means the effective date of the initial public offering of the Common Stock.
- (q) "NON-EMPLOYEE DIRECTOR" means a Director who is not an Employee.
- (r) "NONSTATUTORY STOCK OPTION" means an Option not intended to qualify as an incentive stock option within the meaning of Section 422 of the Code and the regulations promulgated thereunder.
- (s) "OFFICER" means a person who is an officer of the Company within the meaning of Section 16 of the Exchange Act and the rules and regulations promulgated thereunder.
- (t) "OPTION" means a Nonstatutory Stock Option granted pursuant to the Plan.
- (u) "OPTION AGREEMENT" means a written agreement between the Company and an Optionholder evidencing the terms and conditions of an individual Option grant. Each Option Agreement shall be subject to the terms and conditions of the Plan.
- (v) "OPTIONHOLDER" means a person to whom an Option is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Option.
- (w) "PLAN" means this Lexicon Genetics Incorporated 2000 Non-Employee Directors' Stock Option Plan.
- (x) "RULE 16B-3" means Rule 16b-3 promulgated under the Exchange Act or any successor to Rule 16b-3, as in effect from time to time.
- (y) "SECURITIES ACT" means the Securities Act of 1933, as amended.

APPENDIX A

3. ADMINISTRATION.

(a) ADMINISTRATION BY BOARD. The Board shall administer the Plan. The Board may not delegate administration of the Plan to a committee.

(b) POWERS OF BOARD. The Board shall have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine the provisions of each Option to the extent not specified in the Plan.

(ii) To construe and interpret the Plan and Options granted under it, and to establish, amend and revoke rules and regulations for its administration. The Board, in the exercise of this power, may correct any defect, omission or inconsistency in the Plan or in any Option Agreement, in a manner and to the extent it shall deem necessary or expedient to make the Plan fully effective.

(iii) To amend the Plan or an Option as provided in Section 12.

(iv) Generally, to exercise such powers and to perform such acts as the Board deems necessary or expedient to promote the best interests of the Company that are not in conflict with the provisions of the Plan.

(c) EFFECT OF BOARD'S DECISION. All determinations, interpretations and constructions made by the Board in good faith shall not be subject to review by any person and shall be final, binding and conclusive on all persons.

4. SHARES SUBJECT TO THE PLAN.

(a) SHARE RESERVE. Subject to the provisions of Section 11 relating to adjustments upon changes in the Common Stock, the Common Stock that may be issued pursuant to Options shall not exceed in the aggregate Six Hundred Thousand (600,000) shares of Common Stock.

(b) EVERGREEN SHARE RESERVE INCREASE.

(i) Notwithstanding subsection 4(a) hereof, on the day after each Annual Meeting (the "Calculation Date") for a period of ten (10) years, commencing with the Annual Meeting in 2000, the aggregate number of shares of Common Stock that is available for issuance under the Plan shall automatically be increased by that number of shares equal to the greater of (1) three-tenths of one percent (0.3%) of the Diluted Shares Outstanding or (2) the number of shares of Common Stock subject to Options granted during the prior 12-month period; provided, however, that the Board, from time to time, may provide for a lesser increase in the aggregate number of shares of Common Stock that is available for issuance under the Plan.

(ii) "Diluted Shares Outstanding" shall mean, as of any date, (1) the number of outstanding shares of Common Stock of the Company on such Calculation Date, plus (2) the number of shares of Common Stock issuable upon such Calculation Date assuming the conversion of all outstanding Preferred Stock and convertible notes, plus (3) the additional number of dilutive Common Stock equivalent shares outstanding as the result of any options or warrants outstanding during the fiscal year, calculated using the treasury stock method.

(c) REVERSION OF SHARES TO THE SHARE RESERVE. If any Option shall for any reason expire or otherwise terminate, in whole or in part, without having been exercised in full, the shares of Common Stock not acquired under such Option shall revert to and again become available for issuance under the Plan.

(d) SOURCE OF SHARES. The shares of Common Stock subject to the Plan may be unissued shares or reacquired shares, bought on the market or otherwise.

APPENDIX A

5. ELIGIBILITY.

The Options as set forth in section 6 automatically shall be granted under the Plan to all Non-Employee Directors.

6. NON-DISCRETIONARY GRANTS.

(a) INITIAL GRANTS. Without any further action of the Board, each person who is elected or appointed for the first time to be a Non-Employee Director automatically shall, upon the date of his or her initial election or appointment to be a Non-Employee Director, be granted an Initial Grant to purchase Thirty Thousand (30,000) shares of Common Stock on the terms and conditions set forth herein.

(b) ANNUAL GRANTS. Without any further action of the Board, on the day following each Annual Meeting, commencing with the Annual Meeting in 2001, each person who is then a Non-Employee Director, and has been a Non-Employee Director for at least six (6) months, automatically shall be granted an Annual Grant to purchase Ten Thousand (10,000) shares of Common Stock on the terms and conditions set forth herein.

7. OPTION PROVISIONS.

Each Option shall be in such form and shall contain such terms and conditions as required by the Plan. Each Option shall contain such additional terms and conditions, not inconsistent with the Plan, as the Board shall deem appropriate. Each Option shall include (through incorporation of provisions hereof by reference in the Option or otherwise) the substance of each of the following provisions:

(a) TERM. No Option shall be exercisable after the expiration of ten (10) years from the date it was granted.

(b) EXERCISE PRICE. The exercise price of each Option shall be one hundred percent (100%) of the Fair Market Value of the stock subject to the Option on the date the Option is granted.

(c) CONSIDERATION. The purchase price of stock acquired pursuant to an Option may be paid, to the extent permitted by applicable statutes and regulations, in any combination of (i) cash or check, or (ii) delivery to the Company of other Common Stock. The purchase price of Common Stock acquired pursuant to an Option that is paid by delivery to the Company of other Common Stock acquired, directly or indirectly from the Company, shall be paid only by shares of the Common Stock of the Company that have been held for more than six (6) months (or such longer or shorter period of time required to avoid a charge to earnings for financial accounting purposes). At any time that the Company is incorporated in Delaware, payment of the Common Stock's "par value," as defined in the Delaware General Corporation Law, shall not be made by deferred payment.

(d) TRANSFERABILITY. An Option is not transferable, except (i) by will or by the laws of descent and distribution, (ii) by instrument to an inter vivos or testamentary trust, in a form accepted by the Company, in which the Option is to be passed to beneficiaries upon the death of the trustor (settlor) and (iii) by gift, in a form accepted by the Company, to a member of the "immediate family" of the Optionholder as that term is defined in 17 C.F.R. 240.16a-1(e). In addition, Optionholder may, by delivering written notice to the Company, in a form satisfactory to the Company, designate a third party who, in the event of the death of the Optionholder, shall thereafter be entitled to exercise the Option.

(e) VESTING. Options shall vest as follows:

(i) Initial Grants shall provide for vesting of 1/60th of the shares subject to the Option each month after grant for five (5) years after the date of the grant.

APPENDIX A

(ii) Annual Grants shall provide for vesting of 1/12th of the shares subject to the Option each month after grant for twelve (12) months after the date of the grant.

(f) TERMINATION OF CONTINUOUS SERVICE. In the event an Optionholder's Continuous Service terminates (other than upon the Optionholder's death or Disability), the Optionholder may exercise his or her Option (to the extent that the Optionholder was entitled to exercise it as of the date of termination) but only within such period of time ending on the earlier of (i) the date six (6) months following the termination of the Optionholder's Continuous Service, or (ii) the expiration of the term of the Option as set forth in the Option Agreement. If, after termination, the Optionholder does not exercise his or her Option within the time specified in the Option Agreement, the Option shall terminate.

(g) EXTENSION OF TERMINATION DATE. If the exercise of the Option following the termination of the Optionholder's Continuous Service (other than upon the Optionholder's death or Disability) would be prohibited at any time solely because the issuance of shares would violate the registration requirements under the Securities Act, then the Option shall terminate on the earlier of (i) the expiration of the term of the Option set forth in subsection 7(a) or (ii) the expiration of a period of three (3) months after the termination of the Optionholder's Continuous Service during which the exercise of the Option would not be in violation of such registration requirements.

(h) DISABILITY OF OPTIONHOLDER. In the event an Optionholder's Continuous Service terminates as a result of the Optionholder's Disability, the Optionholder may exercise his or her Option (to the extent that the Optionholder was entitled to exercise it as of the date of termination), but only within such period of time ending on the earlier of (i) the date twelve (12) months following such termination or (ii) the expiration of the term of the Option as set forth in the Option Agreement. If, after termination, the Optionholder does not exercise his or her Option within the time specified herein, the Option shall terminate.

(i) DEATH OF OPTIONHOLDER. In the event (i) an Optionholder's Continuous Service terminates as a result of the Optionholder's death or (ii) the Optionholder dies within the three-month period after the termination of the Optionholder's Continuous Service for a reason other than death, then the Option may be exercised (to the extent the Optionholder was entitled to exercise the Option as of the date of death) by the Optionholder's estate, by a person who acquired the right to exercise the Option by bequest or inheritance or by a person designated to exercise the Option upon the Optionholder's death, but only within the period ending on the earlier of (1) the date eighteen (18) months following the date of death or (2) the expiration of the term of such Option as set forth in the Option Agreement. If, after death, the Option is not exercised within the time specified herein, the Option shall terminate.

8. COVENANTS OF THE COMPANY.

(a) AVAILABILITY OF SHARES. During the terms of the Options, the Company shall keep available at all times the number of shares of Common Stock required to satisfy such Options.

(b) SECURITIES LAW COMPLIANCE. The Company shall seek to obtain from each regulatory commission or agency having jurisdiction over the Plan such authority as may be required to grant Options and to issue and sell shares of Common Stock upon exercise of the Options; provided, however, that this undertaking shall not require the Company to register under the Securities Act the Plan, any Option or any stock issued or issuable pursuant to any such Option. If, after reasonable efforts, the Company is unable to obtain from any such regulatory commission or agency the authority which counsel for the Company deems necessary for the lawful issuance and sale of stock under the Plan, the Company shall be relieved from any liability for failure to issue and sell stock upon exercise of such Options unless and until such authority is obtained.

9. USE OF PROCEEDS FROM STOCK.

Proceeds from the sale of stock pursuant to Options shall constitute general funds of the Company.

APPENDIX A

10. MISCELLANEOUS.

(a) **STOCKHOLDER RIGHTS.** No Optionholder shall be deemed to be the holder of, or to have any of the rights of a holder with respect to, any shares subject to such Option unless and until such Optionholder has satisfied all requirements for exercise of the Option pursuant to its terms.

(b) **NO SERVICE RIGHTS.** Nothing in the Plan or any instrument executed or Option granted pursuant thereto shall confer upon any Optionholder any right to continue to serve the Company as a Non-Employee Director or shall affect the right of the Company or an Affiliate to terminate (i) the employment of an Employee with or without notice and with or without cause, (ii) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate or (iii) the service of a Director pursuant to the Bylaws of the Company or an Affiliate, and any applicable provisions of the corporate law of the state in which the Company or the Affiliate is incorporated, as the case may be.

(c) **INVESTMENT ASSURANCES.** The Company may require an Optionholder, as a condition of exercising or acquiring stock under any Option, (i) to give written assurances satisfactory to the Company as to the Optionholder's knowledge and experience in financial and business matters and/or to employ a purchaser representative reasonably satisfactory to the Company who is knowledgeable and experienced in financial and business matters and that he or she is capable of evaluating, alone or together with the purchaser representative, the merits and risks of exercising the Option; and (ii) to give written assurances satisfactory to the Company stating that the Optionholder is acquiring the stock subject to the Option for the Optionholder's own account and not with any present intention of selling or otherwise distributing the stock. The foregoing requirements, and any assurances given pursuant to such requirements, shall be inoperative if (iii) the issuance of the shares upon the exercise or acquisition of stock under the Option has been registered under a then currently effective registration statement under the Securities Act or (iv) as to any particular requirement, a determination is made by counsel for the Company that such requirement need not be met in the circumstances under the then applicable securities laws. The Company may, upon advice of counsel to the Company, place legends on stock certificates issued under the Plan as such counsel deems necessary or appropriate in order to comply with applicable securities laws, including, but not limited to, legends restricting the transfer of the stock.

(d) **WITHHOLDING OBLIGATIONS.** The Optionholder may satisfy any federal, state or local tax withholding obligation relating to the exercise or acquisition of stock under an Option by any of the following means (in addition to the Company's right to withhold from any compensation paid to the Optionholder by the Company) or by a combination of such means: (i) tendering a cash payment; (ii) authorizing the Company to withhold shares from the shares of the Common Stock otherwise issuable to the Optionholder as a result of the exercise or acquisition of stock under the Option, provided, however, that no shares of Common Stock are withheld with a value exceeding the minimum amount of tax required to be withheld by law; or (iii) delivering to the Company owned and unencumbered shares of the Common Stock.

11. ADJUSTMENTS UPON CHANGES IN STOCK.

(a) **CAPITALIZATION ADJUSTMENTS.** If any change is made in the stock subject to the Plan, or subject to any Option, without the receipt of consideration by the Company (through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or other transaction not involving the receipt of consideration by the Company), the Plan will be appropriately adjusted in the class(es) and maximum number of securities subject both to the Plan pursuant to subsection 4(a) and to the nondiscretionary Options specified in Section 5, and the outstanding Options will be appropriately adjusted in the class(es) and number of securities and price per share of stock subject to such outstanding Options. The Board shall make such adjustments, and its determination shall be final, binding and conclusive. (The conversion of any convertible securities of the Company shall not be treated as a transaction "without receipt of consideration" by the Company.)

(b) **CHANGE IN CONTROL -- DISSOLUTION OR LIQUIDATION.** In the event of a dissolution or liquidation of the Company, then all outstanding Options shall terminate immediately prior to such event.

APPENDIX A

(c) CHANGE IN CONTROL -- ASSET SALE, MERGER, CONSOLIDATION OR REVERSE MERGER.

(i) In the event of (i) a sale, lease or other disposition of all or substantially all of the assets of the Company, (ii) a merger or consolidation in which the Company is not the surviving corporation or (iii) a reverse merger in which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger are converted by virtue of the merger into other property, whether in the form of securities, cash or otherwise, then any surviving corporation or acquiring corporation shall assume any Options outstanding under the Plan or shall substitute similar Options (including an option to acquire the same consideration paid to the stockholders in the transaction described in this subsection 11(c) for those outstanding under the Plan).

(ii) In the event any surviving corporation or acquiring corporation refuses to assume such Options or to substitute similar Options for those outstanding under the Plan, then the vesting of such Options and the vesting of any shares of Common Stock acquired pursuant to such Options shall be accelerated in full, and the Options shall terminate if not exercised at or prior to such event.

(iii) In the event any surviving corporation or acquiring corporation assumes such Options or substitutes similar Options for those outstanding under the Plan but the Optionholder is not elected or appointed to the board of directors of the surviving corporation or acquiring corporation at the first meeting of such board of directors after such change in control event, then the vesting of such Options and the vesting of any shares of Common Stock acquired pursuant to such Options shall be accelerated by eighteen (18) months on the day after the first meeting of the board of directors of the surviving corporation or acquiring corporation.

(iv) In the event any surviving corporation or acquiring corporation assumes such Options or substitutes similar Options for those outstanding under the Plan and the Optionholder is elected or appointed to the board of directors of the surviving corporation or acquiring corporation at the first meeting of such board of directors after such change in control event, then the vesting of such Options and the vesting of any shares of Common Stock acquired pursuant to such Options shall not be accelerated.

12. AMENDMENT OF THE PLAN AND OPTIONS.

(a) AMENDMENT OF PLAN. The Board at any time, and from time to time, may amend the Plan. However, except as provided in Section 11 relating to adjustments upon changes in stock, no amendment shall be effective unless approved by the stockholders of the Company to the extent stockholder approval is necessary to satisfy the requirements of Rule 16b-3 or any Nasdaq or securities exchange listing requirements.

(b) STOCKHOLDER APPROVAL. The Board may, in its sole discretion, submit any other amendment to the Plan for stockholder approval.

(c) NO IMPAIRMENT OF RIGHTS. Rights under any Option granted before amendment of the Plan shall not be impaired by any amendment of the Plan unless (i) the Company requests the consent of the Optionholder and (ii) the Optionholder consents in writing.

(d) AMENDMENT OF OPTIONS. The Board at any time, and from time to time, may amend the terms of any one or more Options; provided, however, that the rights under any Option shall not be impaired by any such amendment unless (i) the Company requests the consent of the Optionholder and (ii) the Optionholder consents in writing.

13. TERMINATION OR SUSPENSION OF THE PLAN.

(a) PLAN TERM. The Board may suspend or terminate the Plan at any time. Unless sooner terminated, the Plan shall terminate on the day before the tenth (10th) anniversary of the date the Plan is adopted by the Board or

APPENDIX A

approved by the stockholders of the Company, whichever is earlier. No Options may be granted under the Plan while the Plan is suspended or after it is terminated.

(b) NO IMPAIRMENT OF RIGHTS. Suspension or termination of the Plan shall not impair rights and obligations under any Option granted while the Plan is in effect except with the written consent of the Optionholder.

14. EFFECTIVE DATE OF PLAN.

The Plan shall become effective on the IPO Date, but no Option shall be exercised unless and until the Plan has been approved by the stockholders of the Company, which approval shall be within twelve (12) months before or after the date the Plan is adopted by the Board.

15. CHOICE OF LAW.

All questions concerning the construction, validity and interpretation of this Plan shall be governed by the law of the State of Delaware, without regard to such state's conflict of laws rules.

THE BOARD OF DIRECTORS RECOMMENDS A VOTE FOR PROPOSALS 1, 2 AND 3.

THIS PROXY WILL BE VOTED AS DIRECTED OR, IF NO DIRECTION IS INDICATED, WILL BE VOTED:

"FOR" the election of the nominees for Class II Director;

"FOR" the proposal to ratify and approve an amendment to the Company's 2000 Non-Employee Directors' Stock Option Plan increasing the number of shares of common stock underlying each annual option grant from 6,000 shares to 10,000 shares; and

"FOR" the proposal to ratify and approve the appointment of Ernst & Young LLP as the Company's independent public accountants for the fiscal year ending December 31, 2005.

1. ELECTION OF CLASS II DIRECTORS:	FOR	WITHHOLD
all nominees listed	AUTHORITY	
except as indicated	to vote for	
all nominees		
Nominees: 01 Sam L. Barker, Ph.D.	<input type="checkbox"/>	<input type="checkbox"/>
02 Patricia M. Cloherty		

INSTRUCTION: To withhold authority to vote for any individual nominee, write that nominee's name on the following line.

Please
Mark Here
for Address
Change or
Comments
SEE REVERSE SIDE

2. Ratification and approval of an amendment to the Company's 2000 Non-Employee Directors' Stock Option Plan increasing the number of shares of common stock underlying each annual option grant from 6,000 shares to 10,000 shares.	FOR	AGAINST	ABSTAIN
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Ratification and approval of the appointment of Ernst & Young LLP as the Company's independent auditors for the fiscal year ending December 31, 2005.	FOR	AGAINST	ABSTAIN
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF YOU PLAN TO ATTEND THE MEETING IN PERSON, PLEASE
MARK THE FOLLOWING BOX.

Dated: _____, 2005

(Signature)

(Signature if held jointly)

Please date, sign as name appears at the left, and return promptly. If the shares are registered in the names of two or more persons, each should sign. When signing as Corporate Officer, President, Executor, Administrator, Trustee or Guardian, please give full title. Please note any changes in your address alongside the address as it appears in the proxy.

- FOLD AND DETACH HERE -

PROXY

LEXICON GENETICS INCORPORATED
ANNUAL MEETING OF STOCKHOLDERS
APRIL 27, 2005

THIS PROXY IS SOLICITED ON BEHALF OF THE BOARD OF DIRECTORS OF
LEXICON GENETICS INCORPORATED

The undersigned hereby appoints Arthur T. Sands and Jeffrey L. Wade, and each of them, as proxies and attorneys-in-fact, with the power to act without the other and with power of substitution, to represent the undersigned at the Annual Meeting of Stockholders of Lexicon Genetics Incorporated (the "Company") to be held at The Marriott Woodlands Waterway Hotel and Convention Center, 1601 Lake Robbins Drive, The Woodlands, Texas, on April 27, 2005, at 1:30 p.m., local time, and any adjournments or postponements thereof, and to vote all of the shares of stock the undersigned would be entitled to vote if personally present at such meeting (1) as provided on the other side of this proxy and (2), in their discretion, on such other business as may properly come before such meeting or any adjournment or postponement thereof.

(CONTINUED AND TO BE MARKED, DATED AND SIGNED ON OTHER SIDE)

ADDRESS CHANGE/COMMENTS (MARK THE CORRESPONDING BOX ON THE REVERSE SIDE)

- FOLD AND DETACH HERE -

