

**ROSETTA GENOMICS LTD.
10 Plaut St., Rabin Science Park
Rehovot, 76706
Israel**

NOTICE OF ANNUAL GENERAL MEETING OF SHAREHOLDERS

To Be Held On December 22, 2009

Notice is hereby given that the 2009 Annual General Meeting (the "Annual Meeting") of the Shareholders of Rosetta Genomics Ltd. (the "Company"), an Israeli company, will be held at the offices of Yigal Arnon & Co., Azrieli Center, Round Tower, 47th floor, Tel Aviv, Israel on Tuesday December 22, 2009, at 11:00 a.m. (Israel time) for the following purposes:

1. To approve an increase to the authorized share capital of 10,000,000 ordinary shares so that following such increase, the authorized share capital of the Company shall be 27,578,371 ordinary shares, and to amend the Company's articles of association accordingly.
2. To approve an increase of 1,500,000 ordinary shares available for issuance under the Company's 2006 Employee Incentive Plan (Global Share Incentive Plan (2006)) (the "2006 Plan"), out of which 1,000,000 shares will be dedicated to employees who are U.S. taxpayers;
3. To re-elect Dr. Joshua Rosensweig to serve as a Class II director of the Company until the 2012 Annual General Meeting in accordance with the Company's Articles of Association;
4. To elect Dr. David Sidransky as a member of the Company's Board of Directors to serve as a Class II director of the Company until the 2012 Annual General Meeting in accordance with the Company's Articles of Association and to approve his terms of compensation as a director of the Company as described in the accompanying proxy statement;
5. To elect Mr. Kenneth A. Berlin as a member of the Company's Board of Directors to serve as a Class I director of the Company until the 2011 Annual General Meeting in accordance with the Company's Articles of Association.
6. To approve the grant of options to purchase 12,682 Ordinary Shares, at an exercise price equal to the fair market value per share on the date of grant, vesting over a period of 3 years to Dr. Isaac Bentwich.
7. To approve the modification of the compensation of the Chairman of the Board, Mr. Yoav Z. Chelouche, as described in the accompanying proxy statement.
8. To approve the appointment of Kost, Forer, Gabbay & Kasierer (a member of Ernst & Young Global), as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2009 and its service as the Company's independent registered public accounting firm until the next Annual General Meeting and to authorize the Board of Directors of the Company, upon recommendation of the Audit Committee, to fix remuneration of said firm; and
9. To report on the business of the Company for the year ended December 31, 2008 (including a review of the 2008 financial statements) and to transact such other business as may properly come before the Annual Meeting.

Shareholders of record at the close of business on November 23, 2009, are entitled to notice of, and to vote at, the Annual Meeting. All shareholders are cordially invited to attend the Annual Meeting in person.

Shareholders who do not expect to attend the Annual Meeting in person are requested to mark, date, sign and mail the proxy card and deliver the proxy card to the office of the Company's transfer agent, American Stock Transfer & Trust Company located at 6201 15th Ave, Brooklyn, NY 11219, not less than twenty four (24) hours before the time fixed for the Annual Meeting, unless such requirement is waived by the chairman of the Annual Meeting, in order for a proxy card received before the Annual Meeting to be qualified to participate in the Annual Meeting.

By order of the Board of Directors,

Yoav Z. Chelouche
Chairman of the Board
November 16, 2009

PROXY STATEMENT

**ROSETTA GENOMICS LTD.
10 Plaut St., Rabin Science Park
Rehovot, 76706
Israel**

ANNUAL GENERAL MEETING OF SHAREHOLDERS

To Be Held On December 22, 2009

The enclosed proxy is being solicited by the board of directors (the "Board of Directors") of Rosetta Genomics Ltd. (the "Company") for use at our Annual General Meeting of Shareholders (the "Annual Meeting") to be held on Tuesday, December 22, 2009, or at any postponement or adjournment thereof. The record date for determining shareholders entitled to notice of, and to vote at, the Annual Meeting has been established as of the close of business on Thursday, November 23, 2009.

As of September 30, 2009, we had outstanding 14,174,443 of our ordinary shares, nominal value New Israeli Shekels ("NIS") 0.01 (the "Ordinary Shares").

We expect to solicit proxies by mail and to mail this proxy statement and the accompanying proxy card to shareholders on or about November 30, 2009. We will bear the cost of the preparation and mailing of these proxy materials and the solicitation of proxies. We will, upon request, reimburse banks, brokerage houses, other institutions, nominees, and fiduciaries for their reasonable expenses in forwarding solicitation materials to beneficial owners. These proxy materials shall also be filed on a form 6-K and will be available on the Company's website www.rosettagenomics.com on or around November 16, 2009. Signed proxy cards may be delivered to the Company through the office of its transfer agent, American Stock Transfer & Trust Company, 6201 15th Ave., Brooklyn, NY 11219, not less than twenty four (24) hours before the time fixed for the Annual Meeting in order for the proxy to be qualified to participate in the Annual Meeting or to the Company's Legal Department by email at: proxy2009@rosettagenomics.com

Upon the receipt of a properly executed proxy in the form enclosed, the persons named as proxies therein will vote the Ordinary Shares covered thereby in accordance with the instructions of the shareholder executing the proxy. With respect to each proposal set forth in the accompanying Notice of Annual Meeting of Shareholders (the "Notice of Meeting"), a shareholder may vote in favor of or against the proposal or may abstain from voting on the proposal. Shareholders should specify their choice on the accompanying proxy card. If no specific instruction is given with respect to the matter to be acted upon, the shares represented by a signed proxy will be voted FOR each proposal set forth in the Notice of Meeting. We are not aware of any other matters to be presented at the Annual Meeting.

Any shareholder returning the accompanying proxy may revoke such proxy at any time prior to its exercise by: (i) giving written notice to us of such revocation; (ii) voting in person at the Annual Meeting or requesting the return of the proxy at the Annual Meeting; or (iii) executing and delivering to us a later-dated proxy. Written revocations and later-dated proxies should be sent to the Company at 10 Plaut St., Rabin Science Park, Rehovot, 76706, Israel, Attention: Adv. Tami Fishman Jutkowitz - General Counsel.

Each Ordinary Share is entitled to one vote on each matter to be voted on at the Annual Meeting. Subject to the terms of applicable law, two or more shareholders present, personally or by proxy, who hold or represent together at least 25% of the voting rights of our issued share capital will constitute a quorum for the Annual Meeting. If within half an hour from the time scheduled for the Annual Meeting a quorum is not present, the Annual Meeting shall stand adjourned for one week, until December 29, 2009 at the same time and place, or such time and place as the chairman of our board of directors may determine under applicable law, without it being necessary to notify the shareholders. If a quorum is not present at the adjourned date of the Annual, subject to the terms of applicable law, any two shareholders present in person or by proxy at such meeting shall constitute a quorum. If a quorum is present in person or by proxy, broker non-votes and abstentions will have no effect on whether the requisite vote is obtained for all matters placed before shareholders for their vote, as broker non-votes and abstentions do not constitute voting shares represented at the meeting in person or by proxy, other than with respect to determining whether a quorum is present.

All proposals to be presented at the Annual Meeting require the affirmative vote of shareholders present in person or by proxy and holding Ordinary Shares amounting in the aggregate to at least a majority of the votes actually cast with respect to the proposal.

PRINCIPAL SHAREHOLDERS

The following table sets forth, as of September 30, 2009, the number of ordinary shares beneficially owned by each person or entity known by us to be the beneficial owner of more than 5% of our outstanding ordinary shares. The information in this table is based on [14,174,443] ordinary shares outstanding as of September 30, 2009. Beneficial ownership of shares is determined in accordance with the rules of the SEC and generally includes any shares over which a person exercises sole or shared voting or investment power. Ordinary shares that are subject to convertible securities, warrants or options that are presently convertible or exercisable or convertible or exercisable within 60 days of September 30, 2009 are deemed to be outstanding and beneficially owned by the person holding the convertible securities, warrants or options for the purpose of computing the percentage ownership of that person, but are not treated as outstanding for the purpose of computing the percentage of any other person. None of the persons or entities that we know beneficially owns more than 5% of our outstanding ordinary shares, has different voting rights. Except as indicated in the footnotes to this table, each shareholder in the table has sole voting and investment power for the shares shown as beneficially owned by them.

<u>Name of Beneficial Owner (1)</u>	<u>Number of Shares Beneficially Owned(5)</u>	<u>Percentage of Outstanding Ordinary Shares</u>
Isaac Bentwich, M.D. (2).....	1,570,401	11.1%
Prometheus Laboratories Inc (3).....	2,000,000	14.1%
Far West Capital Management, L.P. (4)	1,311,160	9.3%

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- (1) Unless otherwise noted, the address for each of the individuals noted above is c/o Rosetta Genomics Ltd., 10 Plaut Street, Science Park, Rehovot 76706 Israel.
 - (2) Consists of (i) 1,045,870 ordinary shares directly owned by Dr. Bentwich, and (ii) 524,531 ordinary shares held by Harmony 2000. Harmony 2000 is an Israeli non-profit association, of which Dr. Bentwich is one of seven members and one of three members of its managing board. The members of Harmony 2000's managing board control the securities held by Harmony 2000, and Dr. Bentwich may therefore be deemed to beneficially own the securities owned by Harmony 2000. Dr. Bentwich disclaims any beneficial ownership of the securities owned by Harmony 2000.
 - (3) Based solely on a Schedule 13G filed by Prometheus with the SEC on May 4, 2009. Prometheus' address is 9410 Carroll Park Drive, San Diego, California 92121.
 - (4) Based solely on a Schedule 13G/A filed with the SEC on August 12, 2009. Far West Capital Management's address is 4749 Nicasio Valley Road, Nicasio, California 94946.
 - (5) Our ordinary shares are traded on the NASDAQ Global Market in the United States. A significant portion of our shares are held in street name, therefore we generally have no way of determining who our shareholders are, their geographical location or how many shares a particular shareholder owns although generally any shareholder that beneficially owns 5% or more of our outstanding ordinary shares in required to file a schedule 13D or schedule 13G with the SEC.
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MATTERS RELATING TO THE ANNUAL GENERAL MEETING

At the Annual Meeting, the shareholders will be asked to vote on the following proposals:

PROPOSAL ONE – INCREASING SHARE CAPITAL

Background

As of September 30, 2009, the authorized share capital of the Company is 17,587,371 ordinary shares, and the Company's outstanding share capital is 14,174,44 ordinary shares. In order to allow the Company the flexibility in raising capital in the future to fund its ongoing activities, it is proposed to increase the Company's share capital by an additional 10,000,000 ordinary shares so that following such increase, the authorized share capital of the Company shall be 27,578,371 ordinary shares, and to amend the Company's articles of association whereby Article 4(a) will be replaced in its entirety with the following language:

“4(a) The authorized share capital of the Company is two hundred seventy five thousand seven hundred eighty-four New Israeli Shekels (NIS 275,784) divided into twenty seven million five hundred seventy eight thousand three hundred seventy one (27,578,371) Ordinary Shares, par value NIS 0.01 per share.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED, that the share capital of the Company be increased by an additional 10,000,000 ordinary shares so that following such increase, the authorized share capital of the Company shall be 27,578,371 ordinary shares and that accordingly Article 4(a) of the Company's Articles of Association be replaced in its entirety as set forth above in this Proxy Statement”.

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors' Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE “FOR” THE APPROVAL OF THE APPROVAL OF THE INCREASE OF THE COMPANY’S SHARE CAPITAL AS DESCRIBED IN THIS PROPOSAL ONE.

PROPOSAL TWO – INCREASE OF SHARES AVAILABLE FOR ISSUANCE UNDER THE 2006 PLAN

Background

At the shareholders meeting that took place on July 12, 2006, the shareholders approved the Company's 2006 Employee Incentive Plan (Global Share Incentive Plan (2006)) (the “2006 Plan”), and the grant of options exercisable into ordinary shares pursuant to the 2006 Plan.

Under the 2006 Plan the Company may issue either options or restricted shares, to its employees, consultants and board members. Under the 2006 Plan, the Company may also issue options or restricted shares to the employees, consultants and board members of its subsidiaries, including subsidiaries located in the United States. The aggregate amount of ordinary shares that is currently authorized to be issued under the 2006 Plan is 1,314,988 shares.

As of September 30, 2009 the Company has granted options to purchase 1,385,435 ordinary shares under the 2006 Plan, out of which options to purchase 245,510 ordinary shares were cancelled, and therefore, only 1,139,925 shares currently remain available for issuance under the 2006 Plan. In order to enable to Company to continue to incentivize and encourage its employees, including its newly appointed president and chief executive officer, Kenneth A. Berlin, as well as its consultants and board members by compensating them with options and restricted shares, it is proposed to increase the number of ordinary shares available for issuance under the 2006 Plan by an additional 1,500,000, ordinary shares, out of which 1,000,000 shares will be dedicated to employees who are U.S. taxpayers.

Options granted under the 2006 Plan to U.S. residents may also qualify as incentive stock options within the meaning of Section 422 of the U.S. Internal Revenue Code of 1986, as amended.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED, that the number of ordinary shares available for issuance under the Company’s 2006 Employee Incentive Plan (Global Share Incentive Plan (2006)) be increased by an additional 1,500,000 shares, out of which 1,000,000 shares will be dedicated to employees who are U.S. taxpayers.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors’ Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE “FOR” THE APPROVAL OF THE INCREASE OF THE SHARES AVAILABLE FOR ISSUANCE UNDER THE 2006 PLAN AS DESCRIBED IN THIS PROPOSAL TWO.

PROPOSAL THREE – RE-ELECTION AS CLASS II DIRECTOR

Background

As of the date of this Proxy Statement, the Company’s directors are divided among the following classes:

- **Class I:** The Chairman of the Board Mr. Yoav Z. Chelouche serves as the only Class 1 director, and his term expires at the annual general meeting of shareholders to be held in 2011;
- **Class II:** Dr. Simcha Sadan, and Dr. Joshua Rosensweig currently serve as Class 2 directors, and their terms expire at this Annual Meeting; and
- **Class III:** Prof. Moshe Many and Dr. Isaac Bentwich currently serve as Class 3 directors, and their terms expire at the annual general meeting of shareholders to be held in 2010.

In addition, our two external directors, Gerald Dogon and Tali Yaron-Eldar, were appointed by our shareholders on May 30, 2007 for three-year terms.

Hence, in light of the end of the term of Dr. Joshua Rosensweig, it is proposed to re-elect Dr. Joshua Rosensweig as director of the Board for an additional term of three years. If re-elected at this Annual Meeting, Dr. Rosensweig will serve until the 2012 Annual General Meeting of Shareholders or until his successor is elected and qualified, or until such director’s office is vacated in accordance with the Company’s Articles of Association and the Israel Companies Law-1999. As described below under Proposal Four, it is proposed that Dr. David Sidransky be elected to fill the position of Dr. Simcha Sadan whose term expires at this Annual Meeting and who will not stand for re-election.

Class II Director Nominee

Dr. Joshua Rosensweig has served as a member of our board of directors since May 2004. From September 2003 to September 2006, Dr. Rosensweig served as the Chairman of the board of directors of the First International Bank of Israel. Since 2003, he has also served as member of the board of directors of Plastro Irrigation Systems Ltd. From 1998 to July 2005, Dr. Rosensweig was a senior partner at Gornitzky and Co., a law firm where he specialized in international transactions and taxation, and where he now serves as of counsel. Dr. Rosensweig lectured at Bar-Ilan University, Law School from 1980 to 1995 and at Tel Aviv University, School of Business from 1983 to 1995. Dr. Rosensweig received his J.S.D. (International Taxation), and LL.M. (Taxation) from New York University Law School.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED, to re-elect Dr. Joshua Rosensweig, as a Class II director, to serve until the 2012 annual general meeting of shareholders, or until his successor is elected and qualified, or until such director’s office is vacated in accordance with the Company’s Articles of Association and the Israel Companies Law-1999.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors’ Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE “FOR” THE APPROVAL OF THE RE-ELECTION OF DR. JOSHUA ROSENSWEIG, AS A CLASS II DIRECTOR, TO SERVE UNTIL THE 2012 ANNUAL GENERAL MEETING OF SHAREHOLDERS, OR UNTIL HIS SUCCESSOR IS ELECTED AND QUALIFIED, OR UNTIL SUCH

DIRECTOR'S OFFICE IS VACATED IN ACCORDANCE WITH THE COMPANY'S ARTICLES OF ASSOCIATION AND THE ISRAEL COMPANIES LAW-1999.

PROPOSAL FOUR – ELECTION AS CLASS II DIRECTOR

Background

It is proposed to elect Dr. David Sidransky, as a Class II director of the Board for a term of three years. Dr. Sidransky is proposed to fill the position of Dr. Simcha Sadan whose term expires at this Annual Meeting and who will not stand for re-election. If elected at this Annual Meeting, Dr. Sidransky will serve until the 2012 Annual General Meeting of Shareholders or until his successor is elected and qualified, or until such director's office is vacated in accordance with the Company's Articles of Association and the Israel Companies Law-1999.

It is further proposed to compensate Dr. Sidransky in the same manner and at the same level that has been set for the compensation of External Directors, and Dr. Simcha Sadan. The proposed compensation consists of:

- the grant of options to purchase 12,682 Ordinary Shares, at an exercise price equal to the fair market value per share on the date of grant, vesting over a period of 3 years;
- payment of annual directors fees of \$10,000; and
- payment of an additional amount of \$10,000 in the event that Dr. Sidransky is appointed as a member of one of the Board's committees.

Class II Director Nominee

Dr. David Sidransky is a director of the Head and Neck Cancer Research Division at Johns Hopkins University School of Medicine and is Professor of Oncology, Otolaryngology, Cellular & Molecular Medicine, Urology, Genetics, and Pathology at John Hopkins University and Hospital. Dr. Sidransky is a founder of a number of biotechnology companies and holds numerous biotechnology patents. Dr. Sidransky is the chairman of the board of Champions Biotechnology, and the chairman of the board of Alfacell, and has served as a director of Imclone and Zila Inc. Dr. Sidransky is serving and has served on scientific advisory boards of OncoMethylome Sciences, Cangen, Response Genetics, Zila Inc., Medimmune, and Flight Attendants Medical Research Foundation. Dr. Sidransky is a member of the external advisory board of UCSD Cancer Center, UT M.D. Anderson Cancer Center and Fred Hutchinson Cancer Center (Seattle, WA). Dr. Sidransky received his M.D. from Baylor College of Medicine, Houston, Texas and B.S. (Chemistry) from Brandeis University, Waltham, Massachusetts.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED, to elect Dr. David Sidransky, as a Class II director, to serve until the 2012 annual general meeting of shareholders, or until his successor is elected and qualified, or until such director's office is vacated in accordance with the Company's Articles of Association and the Israel Companies Law-1999 and to approve his terms of compensation as a director of the Company as described in the accompanying proxy statement.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors' Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE “FOR” THE APPROVAL OF THE ELECTION OF DR. DAVID SIDRANSKY, AS A CLASS II DIRECTOR, TO SERVE UNTIL THE 2012 ANNUAL GENERAL MEETING OF SHAREHOLDERS, OR UNTIL HIS SUCCESSOR IS ELECTED AND QUALIFIED, OR UNTIL SUCH DIRECTOR'S OFFICE IS VACATED IN ACCORDANCE WITH THE COMPANY'S ARTICLES OF ASSOCIATION AND THE ISRAEL COMPANIES LAW-1999 AND TO APPROVE HIS TERMS OF COMPENSATION AS A DIRECTOR OF THE COMPANY AS DESCRIBED IN THE ACCOMPANYING PROXY STATEMENT.

PROPOSAL FIVE – ELECTION AS CLASS I DIRECTOR

Background

Effective November 2, 2009, Mr. Kenneth A. Berlin was appointed by the Company's Board of Directors as the Company's President and CEO. It is proposed to elect Mr. Kenneth A. Berlin as a Class I director to serve until the 2011 Annual General Meeting of Shareholders or until his successor is elected and qualified, or until such director's office is vacated in accordance with the Company's Articles of Association and the Israel Companies Law-1999.

Class II Director Nominee

Prior to his appointment as president and CEO of Rosetta Genomics, Mr. Berlin, served as worldwide General Manager at cellular and molecular cancer diagnostics developer Veridex, LLC, a Johnson & Johnson company. Under his leadership the organization grew to over 100 employees, and he spearheaded the launch of three cancer diagnostic products, the acquisition of its cellular diagnostics partner, and delivered significant growth in sales as Veridex transitioned from a research and development entity to a commercial provider of oncology diagnostic products and services. During Mr. Berlin's tenure, Veridex received numerous awards including recognition from the Cleveland Clinic and Prix Galien for the use of its innovative CellSearch® technology in the fight against cancer. Mr. Berlin joined Johnson & Johnson in 1994 and served as corporate counsel for six years. He then held positions of increasing responsibility within Johnson & Johnson and a number of its subsidiary companies. From 2001 until 2004 he served as vice president, licensing and new business development in the pharmaceuticals group, and from 2004 until 2007 was worldwide vice president, franchise development, Ortho-Clinical Diagnostics. Mr. Berlin holds an A.B. degree from Princeton University and a J.D. from the University of California Los Angeles School of Law.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED, to elect Mr. Kenneth A. Berlin, as a Class I director, to serve until the 2011 annual general meeting of shareholders, or until his successor is elected and qualified, or until such director's office is vacated in accordance with the Company's Articles of Association and the Israel Companies Law-1999.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors' Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE “FOR” THE APPROVAL OF THE ELECTION OF Mr. KENNETH A. BERLIN, AS A CLASS I DIRECTOR, TO SERVE UNTIL THE 2011 ANNUAL GENERAL MEETING OF SHAREHOLDERS, OR UNTIL HIS SUCCESSOR IS ELECTED AND QUALIFIED, OR UNTIL SUCH DIRECTOR'S OFFICE IS VACATED IN ACCORDANCE WITH THE COMPANY'S ARTICLES OF ASSOCIATION AND THE ISRAEL COMPANIES LAW-1999.

PROPOSAL SIX – APPROVAL OF THE GRANT OF OPTIONS TO PURCHASE COMPANY'S ORDINARY SHARES TO DR. ISAAC BENTWICH

Background

Until May 2009, Dr. Isaac Bentwich the founder of the Company, a member of the Company's Board of Directors and a principal shareholder, had been employed by the Company in the role of Chief Architect. As an employee of the Company, Dr. Bentwich received compensation due to his role as Chief Architect of the Company and did not receive any compensation in consideration for his activities as a Board Member.

Since Dr. Bentwich ceased serving as Chief Architect in May 2009, he has not received a salary from the Company, and is therefore entitled to be compensated like any other non-employee director (according to the resolution of the shareholders dated July 12, 2006). Accordingly, it is proposed to approve the grant of options to Dr. Isaac Bentwich to purchase 12,682 ordinary shares, at an exercise price equal to the fair market value per share on the date of grant, vesting over a period of 3 years.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED to approve the grant of options to Dr. Isaac Bentwich to purchase 12,682 ordinary shares as described in the accompanying proxy statement.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors' Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE "FOR" THE APPROVAL OF THE GRANT OF OPTIONS TO DR. BENTWICH AS DESCRIBED IN THE ACCOMPANYING PROXY STATEMENT.

PROPOSAL SEVEN – APPROVAL OF AMENDMENT TO COMPENSATION TERMS OF THE CHAIRMAN OF THE BOARD

Background

On July 12, 2006, the Company's shareholders approved the chairmanship agreement, which, among other things, sets the compensation that Mr. Chelouche, as chairman of the Board, is entitled to. One of the compensation components Mr. Chelouche is entitled to under the chairmanship agreement is a monthly fee in the amount of \$7,000. In light of the decrease in the value of the dollar (in comparison with the NIS value) it is proposed to denominate Mr. Chelouche's monthly compensation to new Israeli Shekels, and to set the amount at NIS 32,600, (which is equal to \$7,000 times 4.66, which was the NIS/dollar exchange rate on July 12, 2006, the day of the initial shareholder approval of the chairmanship agreement.

In addition it is proposed that the Company will reimburse Mr. Chelouche for 50% of his home phone expenses provided that such amount shall not exceed NIS700 per month.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED to approve the change in Mr. Chelouche's compensation as described in the accompanying proxy statement.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors' Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE "FOR" THE APPROVAL OF THE CHANGE IN MR. CHELOUCHE'S COMPENSATION AS DESCRIBED IN THE ACCOMPANYING PROXY STATEMENT.

PROPOSAL EIGHT – APPROVAL OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM AND AUTHORIZATION TO DETERMINE COMPENSATION

Background

The Company, based upon the recommendation of the Audit Committee of the Board of Directors, is submitting for approval of its shareholders the reappointment of Kost, Forer, Gabbay & Kasierer (a member of Ernst & Young Global), as its independent registered public accounting firm to audit the consolidated financial statements of the Company and its subsidiaries for the fiscal year ending December 31, 2009, and to serve as its independent registered public accounting firm until the next Annual General Meeting. The Company is also submitting for approval of its shareholders the authorization of the Company's Board of Directors, upon recommendation of the Audit Committee, to fix the remuneration of said firm in accordance with the volume and nature of their services. The Audit Committee will pre-approve all services to be performed by, and compensation to be paid to, the independent registered public accounting firm as provided by the U.S. Sarbanes-Oxley Act of 2002 and the rules promulgated thereunder. Representatives of Kost, Forer, Gabbay and Kasierer will not be present at the Annual Meeting.

THE BOARD OF DIRECTORS WILL PRESENT THE FOLLOWING RESOLUTION AT THE MEETING:

“RESOLVED, to approve the appointment of Kost, Forer, Gabbay & Kasierer (a member of Ernst & Young Global), as the Company's independent registered public accounting firm to audit the consolidated financial statements of the Company for the fiscal year ending December 31, 2009, and its service as the Company's independent registered public accounting firm until the next Annual General Meeting, and to authorize the Company's Board of Directors, upon recommendation of the Audit Committee, to fix the remuneration of said firm in accordance with the volume and nature of their services.”

An affirmative vote of a majority of the shares represented and voting at the Annual Meeting in person or by proxy is required for the approval of such resolution.

Board of Directors' Recommendation:

THE BOARD OF DIRECTORS RECOMMENDS THAT YOU VOTE “FOR” THE APPROVAL OF THE APPOINTMENT OF KOST, FORER, GABBAY & KASIERER (A MEMBER OF ERNST & YOUNG GLOBAL), AS THE COMPANY’S INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM AND THE AUTHORIZATION OF THE BOARD OF DIRECTORS, UPON RECOMMENDATION OF THE AUDIT COMMITTEE, TO DETERMINE THEIR REMUNERATION IN ACCORDANCE WITH THE VOLUME AND NATURE OF THEIR SERVICES.

**REPORT OF THE BOARD OF DIRECTORS ON THE BUSINESS OF THE COMPANY
FOR THE YEAR ENDED DECEMBER 31, 2008 AND REVIEW OF THE 2008
FINANCIAL STATEMENTS**

In accordance with Section 60(b) of the Israeli Companies Law-1999, at the Annual Meeting, the audited consolidated financial statements of the Company for the year ended December 31, 2008 and the Company’s annual report for 2008 will be reviewed and discussed.

The Annual Report on Form 20-F of the Company for the year ended December 31, 2008, which includes the audited consolidated financial statements of the Company, is available on the “Investors – SEC Filing” section of our website, at www.rosettagenomics.com.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We are subject to the information reporting requirements of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), applicable to foreign private issuers and fulfill these requirements by filing reports with the SEC. You may read and copy any document we file with the SEC at the SEC’s Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. You may call the SEC at 1-800-SEC-0330 for further information about the SEC’s public reference room. Our SEC filings are also available to the public at the SEC’s website at www.sec.gov and through the “Investors – SEC Filing” section of our website at www.rosettagenomics.com.

As a foreign private issuer, we are exempt from the rules under the Exchange Act related to the furnishing and content of proxy statements. The circulation of the Notice of Meeting and this proxy statement should not be taken as an admission that we are subject to the proxy rules under the Exchange Act.

OTHER MATTERS

As of the date of this proxy statement, no shareholder had advised us of the intent to present any other matters, and we are not aware of any other matters to be presented, at the Annual Meeting. Accordingly, the only items of business that our Board of Directors intends to present at the Annual Meeting are set forth in this proxy statement.

If any other matter or matters are properly brought before the meeting, the persons named as proxy holders will use their discretion to vote on the matters in accordance with their best judgment as they deem advisable.

By order of the Board of Directors,

Yoav Z. Chelouche
Chairman of the Board