



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

DIVISION OF
CORPORATION FINANCE

Mail Stop 4546

January 4, 2017

Kenneth A. Berlin
Chief Executive Officer and President
Rosetta Genomics Ltd.
10 Plaut Street, Science Park
Rehovot 76706 POB 4059
Israel

**Re: Rosetta Genomics Ltd.
Registration Statement on Form F-1
Filed December 8, 2016
File No. 333-214981**

Dear Mr. Berlin:

We have limited our review of your registration statement to those issues we have addressed in our comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

General

1. Given the nature of the offering and its size relative to the number of shares outstanding held by non-affiliates, the transaction appears to be a primary offering. Because you are not eligible to conduct a primary offering on Form F-3, you are not eligible to conduct an at-the-market offering under Rule 415(a)(4). Please revise to fix the price at which the shares will be sold and name the selling stockholders as underwriters. If you disagree, please tell us your basis for determining that the transaction is appropriately characterized as a transaction that is eligible to be made under Rule 415(a)(1)(i). In your analysis, please address the following among any other relevant factors:

- the number of selling stockholders and the percentage of the overall offering made by each stockholder;
- the date on which and the manner in which each selling stockholder received the shares and/or the overlying securities;
- the relationship of each selling stockholder with you, including an analysis of whether the selling stockholder is an affiliate of the company;
- any relationships among the selling stockholders;
- the dollar value of the shares registered in relation to the proceeds that you received from the selling stockholders for the securities, excluding amounts of proceeds that were returned (or will be returned) to the selling stockholders and/or their affiliates in fees or other payments;
- the discount at which the stockholders will purchase the ordinary shares underlying the convertible securities upon conversion or exercise;
- whether or not any of the selling stockholders is in the business of buying and selling securities; and
- the probability that the conversion and exercise prices will be based on a future VWAP measurement that is significantly lower than the initial \$.50 conversion price applicable to the debentures and the initial \$.85 exercise price applicable to the warrants given (i) your disclosure on page 9 concerning an on-going NASDAQ bid price deficiency that predates the private placement and (ii) reset provisions in the convertible debenture and purchase warrant agreements that are triggered upon a reverse stock split.

2. Please tell us the following:

- whether you have the intention, and the financial ability, to make all payments on the debentures given the “substantial liquidity issues” cited in the audit report for your December 8, 2016 restatement to your December 31, 2015 financial statements;
- whether – based on information obtained from the selling stockholders – any of the selling stockholders have an existing short position or hedging/loan/pledge or other arrangement with a broker-dealer in your ordinary shares and, if so, the following additional information:
 - the date on which each such selling stockholder entered into that position; and

- the relationship of the date on which each such selling stockholder entered into that position to the date of the announcement of the convertible debenture transaction and the filing of the registration statement; and
- whether – based on information obtained from the selling stockholders and with reference to the Plan of Distribution (Annex A) to the Registration Rights Agreement– any of the selling stockholders will engage in (i) short selling or (ii) hedging/loan/pledge or other transactions with broker-dealers who may engage in short sales of your ordinary shares.

Exhibit 5.1

3. Please have counsel delete the limitation on reliance in the eleventh paragraph that the opinion “is being delivered to you solely for your information in connection with the above matter and may not be relied upon in any manner by any other person and is not to be used, circulated, quoted or otherwise referred to for any other purpose without our express written permission.” For guidance, refer to Section II.B.3.d of Staff Legal Bulletin No. 19, which is available on our website.

We remind you that the company and its management are responsible for the accuracy and adequacy of their disclosures, notwithstanding any review, comments, action or absence of action by the staff.

Refer to Rules 460 and 461 regarding requests for acceleration. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

Please contact Irene Paik at (202) 551-6553 or Joseph McCann at (202) 551-6262 with any questions.

Sincerely,

/s/ Joseph McCann for

Suzanne Hayes
Assistant Director
Office of Healthcare and Insurance

cc: Brian Keane, Esq.
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.