



DIVISION OF
CORPORATION FINANCE

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

May 12, 2011

Mr. Jonathan S. Wolfson
Chief Executive Officer
Solazyme, Inc.
225 Gateway Boulevard
South San Francisco, CA 94080

**Re: Solazyme, Inc.
Amendment No. 3 to Registration Statement on Form S-1
Filed May 4, 2011
File No. 333-172790
Supplemental Response Letter Dated May 12, 2011**

Dear Mr. Wolfson:

We have reviewed your registration statement and have the following 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.

Significant Partner agreement, page 46

1. We have read your response to prior comment four from our letter dated May 10, 2011. In responding to our comment, please tell us the specific line items and quantify the impact to your financial statements related to your intended accounting treatment for the warrant issued to Bunge Limited to purchase one million shares of your common stock.

Management's Discussion and Analysis, page 48

2. We have read your proposed disclosure to prior comment five from our letter dated May 10, 2011. Please also disclose the stock compensation charge related to the 1.3 million options granted on December 16, 2010.

Stock Based Compensation, page 52

3. We have read your response to prior comment six from our letter dated May 10, 2011. Please confirm to us that there was not a private sale of shares on March 9, 2011 as indicated on page 57.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Act of 1933 and all applicable Securities Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

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You may contact Tracey McKoy at (202) 551-3772 or Alfred Pavot at (202) 551-3738 if you have questions regarding comments on the financial statements and related matters. Please contact Jessica Dickerson at (202) 551-3749 or me at (202) 551-3765 with any other questions.

Sincerely,

Pamela Long
Assistant Director

cc: Alan F. Denenberg
Davis Polk & Wardwell LLP
via facsimile at (650) 752-3604