



DIVISION OF
CORPORATION FINANCE

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

October 14, 2010

Via U.S. Mail

Mr. Peter Wirth
Executive Vice President
Genzyme Corporation
500 Kendall Street
Cambridge, Massachusetts 02142

**Re: Genzyme Corporation
Schedule 14D-9
Filed on October 7, 2010
File No. 005-37205**

Dear Mr. Wirth:

We have reviewed your filing 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 filing, by providing the requested information, or by advising us when you will provide the requested response. 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 filing and the information you provide in response to these comments, we may have additional comments.

Interest in Securities of the Subject Company, page 33

1. We note disclosure regarding your \$1 billion accelerated share repurchase program, with Goldman Sachs as counterparty. Please confirm that there have been no transactions associated with this program during the past 60 days, or provide the disclosure required by Item 1008(b) of Regulation M-A.
2. Please provide us with your analysis under Rule 13e-1 with respect to this program.

The Solicitation or Recommendation

Reasons for the Recommendation of the Company Board, page 29

3. The disclosure in this section refers to a variety of factors considered by the board of directors in reaching its recommendation that security holders reject the offer. However, Item 4 of Schedule 14D-9 and corresponding Item 1012(b) of Regulation M-A require that actual reasons be cited to explain why an unfavorable recommendation is being made. Please revise this section to expressly state reasons that in fact support the board of director's decision to recommend that security holders reject the offer.
4. We note your references to presentations by your financial advisors. Notwithstanding the absence of a specific item requirement in Schedule 14D-9, please advise what consideration has been given to summarizing the advisors' bases for and methods of arriving at their findings and attaching as an exhibit any written analyses or presentation materials used in issuing their advisory opinions. Refer to Item 8 of Schedule 14D-9 and Item 1011(b) of Regulation M-A.

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 Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management persons are in possession of all facts relating to their disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Mr. Peter Wirth
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You may contact me at (202) 551-3503 if you have any questions regarding our comments, or, if you require further assistance, you may call Nicholas P. Panos, Senior Special Counsel, at (202) 551-3266.

Sincerely,

David L. Orlic
Special Counsel
Office of Mergers & Acquisitions

cc: Via facsimile: (617) 235-0822
Paul M. Kinsella, Esq.
Ropes & Gray LLP