



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

March 26, 2010

Via Facsimile (617) 951-7050 and US Mail

Henri A. Termeer
Chairman & Chief Executive Officer
Genzyme Corporation
500 Kendall Street
Cambridge, MA 02142

**Re: Genzyme Corporation
Amendment No. 1 to Preliminary Proxy Statement on
Schedule 14A
Filed March 22, 2010
File No. 0-14680**

Dear Mr. Termeer:

We have reviewed your amended filing and have the following comments.

General

1. In responses to our comments, you have indicated that you do not *expect* Relational, its affiliates and Mr. Whitworth to be “participants” in the current solicitation of proxies (emphasis added). Please advise why this statement is qualified in this manner.
2. Please refer to our prior comment. Notwithstanding your response, it is not apparent that interpretation of the provisions of Section 3 of the Relational Agreement are limited in the manner you describe and/or that Section 5 prohibits solicitations of proxies in the context of solicitations in favor of incumbent management. Please advise. Further, please revise the disclosure to clearly state, if true, that Relational or its affiliates will not solicit proxies or otherwise engage in the activities that would render them participants as such term is defined in Instruction 3 to Item 4 of Schedule 14A in the current solicitation. In the alternative, please identify, to the extent applicable, Relational and/or its affiliates as participants.

Agreement with Relational Investors, LLC., page 13

3. We refer to disclosure stating the agreement was entered into after several months of constructive dialogue, that such dialogue has continued and indicating the “fresh perspectives” that Relational has brought to the Board. Please revise to succinctly clarify the reasons why Relational and the company first engaged in discussions. Describe who approached whom and disclose concisely, any material agenda items discussed and the “fresh perspectives” that have been and/or continue to be a part of the constructive dialogue between the parties. For example, has Relational or the Company expressed an interest in additional board representation by Relational (i.e., in addition to Mr. Whitworth if nominated)?

* * *

Please respond to the above comments promptly and comply with our comments when disseminating information in the future. If you believe that compliance with our comments is not appropriate, please provide the basis for your view in your response letter filed via EDGAR and tagged as “CORRESP”. You should be aware, however, that we may have additional comments based on your supplemental response.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings to be certain that the filing includes all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment decision. 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.

In connection with responding to our comments, please provide, in writing, a statement from the participants acknowledging that:

- the participants are responsible for the adequacy and accuracy of the disclosure in the filings;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filings; and
- the participants 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.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filings or in response to our comments on your filings.

Mr. H. Termeer
Genzyme Corporation
March 26, 2010
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Please direct any questions to me at (202) 551-3757. You may also contact me via facsimile at (202) 772-9203. Please send all correspondence to us at the following ZIP code: 20549-3628.

Sincerely,

Melissa Campbell Duru
Special Counsel
Office of Mergers and Acquisitions

Cc (via facsimile): Paul Kinsella, Esq.