



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

April 13, 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. 2 to Preliminary Proxy Statement on
Schedule 14A
Filed March 31, 2010
File No. 0-14680**

Dear Mr. Termeer:

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

General

1. We remind you of prior comment 3 of our letter dated March 18, 2010. We refer to the news article at <http://www.foxbusiness.com/story/markets/industries/technology/icahns-board-push-genzyme-hit-antitrust-snap/> quoting statements provided by Mr. Peter Wirth, executive vice president of Genzyme and stating that "Genzyme believes its competition with Biogen meets the [Clayton Act's] threshold for what is not allowed" under the Act. Similar statements regarding the company's belief that the election of two of the Icahn nominees would violate the Clayton Act are attributed to the company in the Wall Street Journal Article at <http://online.wsj.com/article/SB10001424052702303591204575170261738319340.html>. It would appear that statements made by Mr. Wirth and the company that comment upon the Icahn nominees are soliciting materials that should have been filed under cover of Schedule 14A on the date of first use. Please refer to Rule 14a-6(b) and (c) and make the requisite filings.

PRER 14A filed March 31, 2010

2. Support for each statement or assertion of opinion or belief must be self-evident, disclosed in the proxy materials, or provided to the staff on a supplemental basis.

Please provide further support for disclosure in the letter to shareholders disclosing the participants' view that the election of the Icahn nominees is not in the best interest of shareholders. In this regard, we note statements that appear to be attributable to the company regarding potential Clayton Act violations as referenced in our prior comment. It would appear that the participants' view advising against election of the Icahn nominees is in part based on information regarding potential Clayton Act violations. Accordingly, please revise to include disclosure in the proxy statement that succinctly delineates any such concerns. Supplementally, please provide us with quantitative data supporting the views attributed to the company that the election of Messrs. Denner and Mulligan could trigger Section 8 of the Clayton Act. We may have further comment.

* * *

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
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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,

Mellissa Campbell Duru
Special Counsel
Office of Mergers and Acquisitions

Cc (via facsimile): Paul Kinsella, Esq.