

Via Facsimile and U.S. Mail
Mail Stop 6010

April 19, 2007

Mr. Michael S. Wyzga
Executive Vice President, Finance, Chief Financial
Officer and Chief Accounting Officer
Genzyme Corporation
500 Kendall Street
Cambridge, MA 02142

**Re: Genzyme Corporation
Form 10-K for Fiscal Year Ended December 31, 2006
File No. 0-14680**

Dear Mr. Wyzga:

We have limited our review of your filing to the issues we have addressed in our comments. In our comments, we ask you to provide us with more information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filings. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K for the year ended December 31, 2006

Management's Discussion and Analysis of Genzyme Corporation and Subsidiaries'
Financial Condition and Results of Operations

Critical Accounting Policies and Significant Judgments and Estimates, page F-11

1. Although you discuss numerous estimates and the nature of the uncertainties underlying these estimates, you do not appear to discuss or quantify the related variability in operating results that you expect to be reasonably likely to occur. For each of your identified critical accounting policies and estimates please provide us in a disclosure-type format revised disclosure that:
 - quantifies the changes in your estimates that you recorded during each of the periods covered in your filing; and

- quantifies the expected reasonably likely variability of your estimates as of the latest balance sheet date presented in your filing.

Financial Statements

Note C: Mergers and Acquisitions

Acquisition of AnorMED, page F-89

2. You disclose that you accounted for the acquisition of AnorMED as a business combination. It is apparent from the March 31, 2006 Form 40-F of AnorMED that it had no product revenues and only minimal licensing revenues in fiscal 2006. In addition, it appears from your table of acquired in-process research and development on page F-96 that you allocated a substantial portion of the purchase price to the Mozobil project and that you are uncertain whether to pursue the development of AMD070. Please explain to us why your accounting for the purchase of AnorMED as a business combination with goodwill being recorded is appropriate. Please reference the authoritative literature you rely upon to support your accounting. In your response, specifically explain to us why you did not effectively acquire the Mozobil assets. Please explain to us how you determined a fair value of the AMD070 project if you are still assessing your future development plans. Please tell us how AnorMED qualifies as a business under paragraph 4 of SFAS 141 and EITF 98-3. In addition, assuming that you can substantiate business combination accounting, please explain to us why goodwill is warranted in the acquisition of an apparent research and development company and why you have not allocated a larger portion of the purchase price to identifiable intangible assets, such as core technology, patents, trade secrets, license arrangements, trademarks, etc.

Note H: Goodwill and Other Intangible Assets, Page F-100

3. You disclose that you recorded an impairment charge for all the goodwill at your Genetics reporting unit as a result of the reduction of reimbursement rates for certain test offerings and increased infrastructure costs. You also disclose that the long-lived assets of this reporting unit are not impaired. We are unable to locate significant disclosure discussing the reduced reimbursement rates or the increased infrastructure costs. Please provide us in a disclosure-type format, revised disclosure that discusses the chronology of events that led to the reduced reimbursement rates and increased infrastructure costs or tell us where you have disclosed this information in your filing. In your response, please explain whether the reduced reimbursement rates are the result of third-party actions, such as government regulations or insurance carrier price control measures, or internally imposed reductions for competitive reasons. Also in your response, please expand on your increased infrastructure costs. In addition, please explain to us why your Genetics reporting unit goodwill was not impaired in prior years as it

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appears based on your segment disclosure in Note Q that this unit has historically reported losses.

Please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a letter that keys your responses to our comments and provides the requested information. Detailed letters greatly facilitate our review. Please furnish your letter on EDGAR under the form type label CORRESP.

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 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 your letter, a 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.

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 filing or in response to our comments on your filing.

If you have any questions, please contact Mark Brunhofer, Senior Staff Accountant, at (202) 551-3638. In this regard, do not hesitate to contact me, at (202) 551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief
Accountant