

Mail Stop 6010
Via Facsimile and U.S. Mail

July 2, 2008

Mr. Henri A. Termeer
Principal Executive Officer
Genzyme Corporation
500 Kendall Street
Cambridge, Massachusetts 02142

**Re: Genzyme Corporation
Form 10-K for Fiscal Year Ended December 31, 2007
Form 10-Q for Fiscal Quarter Ended March 31, 2008
File No. 0-14680**

Dear Mr. Termeer:

We have reviewed your filings and have the following comments. In our comments, we ask you to provide us with information to better understand your disclosure. Where a comment requests you to revise disclosure, the information you provide should show us what the revised disclosure will look like and identify the annual or quarterly filing, as applicable, in which you intend to first include it. If you do not believe that revised disclosure is necessary, explain the reason in your response. After reviewing the information provided, we may raise additional comments and/or request that you amend your filings.

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 filing. 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 Fiscal Year Ended December 31, 2007

Item 1. Business

Patents, License Agreements and Trademarks, page 19

1. We note that you have not disclosed patent information for patents that you have licensed from others either through collaboration or traditional license

agreements. Please expand your disclosure to provide patent information for material patents held by third parties relating to the products listed on page 20 or, in the alternative, please explain to us why some or all of the patent information about those products is not required.

Management's Discussion and Analysis of Financial Condition and Results of Operations

Critical Accounting Policies and Significant Judgments and Estimates

In-Process Research and Development, page F-16

2. You state that use of different estimates and judgments could result in materially different asset values and IPR&D charges. However, it does not appear that you have described and quantified the underlying assumptions used to determine fair value, which appear to have a significant impact on your financial statements. For example, in connection with the 2007 acquisitions of DCL and Bioenvision, you capitalized other intangible assets of \$202.4 million and recognized IPR&D charges of \$125.5 million. Please describe and quantify all key assumptions used to determine fair value for the acquired technologies in each period presented.
3. In your 2007 acquisition of Bioenvision, you charged \$125.5 million of acquired technology to IPR&D and capitalized \$172.4 million of acquired technology as other intangible assets. While you describe your basis for the IPR&D charge as due to the need for substantial additional research and development for the Evoltra program to achieve technological feasibility, you also disclose that its product launch could occur in 2008. In addition, we note that prior to your acquisition, Evoltra was already being sold for other indications. Please expand your disclosure to describe more specifically and quantify the nature of the estimates and judgments supporting your decisions to capitalize or expense acquired technology, particularly how you determined the existence of technological feasibility and alternative future uses. In addition, expand your disclosure to include the following information.
 - Describe and quantify the individually material projects and the core technologies comprising other intangible assets capitalized for each year presented.
 - Describe more specifically the nature, timing and estimated costs necessary to complete the acquired IPR&D projects, such as the nature of "tangible and intangible assets required for successful exploitation of the technology."
 - Describe the risks and uncertainties associated with completing project development on schedule and the consequences of a failure to meet planned deadlines.

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Note N – Commitments and Contingencies, page F-116

4. You disclose that you reached an agreement in principle to settle your tracking stock litigation for \$64.0 million on August 6, 2007, and recorded a liability for the settlement charge in that amount in June 2007. Please tell us how you concluded that the amount of the estimated loss or range of loss relating to this litigation could not be made at December 31, 2006 and March 31, 2007, and explain how your accounting for this contingency complied with the accounting and disclosure requirements of SFAS 5 and FIN 14 at each of those dates. Please ensure that your response addresses when you first began evaluating internally the terms of any proposed settlements and entered into discussions with external parties regarding the terms of potential settlements. We may have additional comments after reviewing your response.

Form 10-Q for the Fiscal Quarter Ended March 31, 2008

Notes to Unaudited Consolidated Financial Statements

8. Investments in Equity Securities, page 22

5. You accounted for the \$69.9 million premium paid in connection with your \$150 million purchase of 5 million shares of Isis common stock as a charge to research and development expense. Please expand your disclosure to describe more specifically and quantify the factors supporting your decision to expense this \$69.9 million premium. Refer us to the technical guidance upon which you based this accounting treatment.

9. Joint Venture with BioMarin, page 22

6. In connection with the January 1, 2008 consolidation of BioMarin/Genzyme LLC, you recorded a \$480.5 million intangible asset and a corresponding non current liability, reflecting the negative value of this joint venture's underlying intellectual property. Previously, it had been outlicensed to you and BioMarin for no consideration. Please refer us to the technical guidance upon which you based this accounting treatment, particularly how you determined fair value for this intellectual property and your basis for recording the \$480.5 million non current liability. Also, describe more specifically the factors supporting your conclusion that these licenses had a negative value.

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Please respond to the comments within 10 business days or tell us when you will provide us with a response. Your letter should key your responses to our comments.

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Detailed cover 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 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 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.

You may contact Frank Wyman, Staff Accountant, at 202-551-3660 or Carlton Tartar, Accounting Branch Chief, at 202-551-3387, if you have questions regarding the processing of your response as well as any questions regarding comments on the financial statements and related matters. You may contact Sebastian Gomez Abero, Staff Attorney, at (202) 551-3578 or Jeffrey Riedler, Assistant Director, at (202) 551-3715 with questions on any of the other comments. In this regard, do not hesitate to contact me, at 202-551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief Accountant