

Mail Stop 6010
Via Facsimile and U.S. Mail

October 14, 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 August 8, 2008 response to our July 2, 2008 letter and have the following comment. In our comment, we ask you to provide us with information to better understand your disclosure. Where it 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.

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

Notes to Unaudited Consolidated Financial Statements

9. Joint Venture with BioMarin, page 22

1. Please refer to prior comment six. You disclose that prior to the restructuring, the LLC conducted all research and development, manufacturing and commercialization activities. Subsequent to the restructuring, the LLC will perform only research and development, BioMarin will perform only manufacturing activities and you will be responsible for all commercialization activities. Please address the following with respect to your accounting for the restructuring of this joint venture.
 - The license of technology rights to you and BioMarin at zero cost and on a royalty-free basis appears to indicate that these technology rights have no

economic value. However, in your consolidation under FIN 46R, you attributed \$480.5 million to these rights. Please explain this apparent inconsistency, and tell us how the technology rights meet the definition of an asset under FASB Statement of Concepts No. 6. Please address why the recorded amount represents an asset in your consolidated financial statements, rather than from the perspective of the LLC as indicated in your response. Also, please explain the key assumptions used in your determination of this fair value.

- You state that the \$480.5 million liability represents the value of “out-of-the-money license contracts between the LLC, us and BioMarin.” Please provide a more comprehensive explanation of your basis for recording this liability, including how the out-licensing of the technology represents a liability in your consolidated financial statements as defined by FASB Statement of Concepts No. 6, particularly given that you are one of the beneficiaries of the out-licensing agreement.
- Please tell us the amounts that are recorded in your financial statements for each period presented due to the consolidation of the restructured joint venture, including the treatment of the equity investment prior to the restructuring, as well as each respective amount recorded in your statement of operations relating to the consolidation of the entity, including the line item(s) in which the amortization of the recorded asset and liability are included.

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Please respond to the comment within 10 business days or tell us when you will provide us with a response. Your letter should key your response to our comment. Detailed cover letters greatly facilitate our review. Please furnish your letter on EDGAR under the form type label CORRESP.

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 comment. In this regard, do not hesitate to contact me, at 202-551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief Accountant