



DIVISION OF
CORPORATION FINANCE

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

June 11, 2010

Michael S. Wyzga
Chief Financial Officer
Genzyme Corporation
500 Kendall Street
Cambridge, MA 02142

**Re: Genzyme Corporation
Form 10-K for Fiscal Year Ended December 31, 2009
Filed March 1, 2010
File No. 000-14680**

Dear Mr. Wyzga:

We have reviewed your May 25, 2010 response to our April 27, 2010 letter and have the following comments. In some of our comments, we ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by providing the requested information or by advising us when you will provide the requested response. 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 a comment applies to your facts and circumstances, please tell us why in your response. Please furnish us a letter on EDGAR under the form type label CORRESP that keys your responses to our comments.

After reviewing the information provided, we may raise additional comments and/or request that you amend your filing.

Patents, License Agreements and Trademarks, page 24

1. We note your response to comment four. In particular, we note the following disclosure with regard to the range of royalties that must be paid in relation to your products:
 - For Myozyme, a royalty on net sales to Synpac ranging from “mid single digit to low double digits;” and
 - For Clolar, a royalty on net sales of the product in Asia “in the double digits;”

Please revise your disclosure to narrow the range of royalties under your license agreements to a maximum range of 10%. For example, acceptable disclosure for the range of royalties would include royalties “between 10% and 20%,” in the “mid single digits to low teens,” or “in the twenties.”

2. It appears that you are substantially dependent on your license agreement for Fabrazyme because a material portion of your revenues is based upon sales of this product. Please file your license agreement with Mount Sinai School of Medicine in relation to the patent for Fabrazyme as an exhibit to your filing.

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

Strategic Transactions, page 47

3. We note your response to comment five. In our view, the acquisitions from Bayer did not occur in the ordinary course of business based upon the accounting of the transaction as a business combination, the recording of contingent purchase obligations of \$964.1 million, and the significant potential payments that may be required under the underlying license agreements. As such, we continue to believe that the transaction is material to the Company and that the underlying agreements should be filed as exhibits. Accordingly, please file the agreements with Bayer underlying your acquisition of the licensed rights to alemtuzumab, Campath, Fludara, and Leukine.

Revenues

Cardiometabolic and Renal, page 66

4. Please refer to your response to our comment seven. Please revise to disclose your current assessment of the expected effects on your results of operations, financial position and liquidity of the expiration of patents relating to Renagel, Renvela and Hectorol such as the effect is unknown or that the effect will be adverse but that you cannot estimate it. Further, please revise to disclose, as applicable, the reasons it is unknown or that an estimate cannot be made including the nature of the variables that affect your assessment/estimate.

You may contact Tabatha Akins, Staff Accountant (202) 551-3658 or Mary Mast, Senior Staff Accountant at (202) 551-3613 if you have questions regarding comments on the financial statements and related matters. Please contact Bryan Pitko, Attorney Advisor at (202) 551-3203 or me at (202) 551-3679 with any other questions.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief Accountant