



UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549-7010

Mail Stop 7010

March 31, 2008

By U.S. Mail and Facsimile

Mr. Michael R. Hogan  
Chief Financial Officer  
Sigma-Aldrich Corporation  
3050 Spruce Street  
St. Louis, Missouri 63103

**Re: Sigma-Aldrich Corporation**  
**Form 10-K for the Fiscal Year Ended December 31, 2007**  
**File No. 000-08135**

Dear Mr. Hogan:

We have reviewed your filings and have the following comments. Where indicated, we think you should revise your documents in response to these comments. If you disagree, we will consider your explanation as to why our comments are inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with 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 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

Exhibit 13

Management's Discussion and Analysis, page 21

Operating Results, page 25

1. In future filings, please expand your discussion of the results of your operations to quantify the impact that changes in units sold and/or changes in selling price had on net sales of your business units from period to period.

Note 15 – Earnings Per Share, page 48

2. In future filings, please disclose the number of shares that could potentially dilute basic earnings per share that were not included in the computation of diluted earnings per share because to do so would have been antidilutive for the periods presented. See paragraph 40(c) of SFAS 128 for guidance.

Exhibit 31 – Section 302 Certifications

3. We note that paragraphs 2, 3, and 4 of your certifications replace the word “report” with “annual report”. In your future annual and quarterly filings, please provide your certifications using the exact language as provided in Item 601(b)(31)(i) of Regulation S-K.

\* \* \*

Please respond to these comments within 10 business days, or tell us when you will provide us with a response. Please provide us with a response letter that keys your responses to our comments and provides any requested information. Detailed letters greatly facilitate our review. Please furnish your response on EDGAR as a correspondence file. Please understand that we may have additional comments after reviewing your responses to our comments.

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 writing, a statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in their 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.

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If you have any questions regarding these comments, you may contact Dale  
Welcome, Staff Accountant, at (202) 551-3865 or, in his absence, to the undersigned at  
(202) 551-3768.

Sincerely,

John Cash  
Accounting Branch Chief