



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

DIVISION OF
CORPORATION FINANCE

April 17, 2012

Via E-mail

Ms. Jan A. Bertsch
Chief Financial Officer
Sigma-Aldrich Corporation
3050 Spruce Street
St. Louis, MO 63103

**Re: Sigma-Aldrich Corporation
Form 10-K for the Fiscal Year Ended December 31, 2011
Filed February 13, 2012
Definitive Proxy Statement on Schedule 14A
Filed March 12, 2012
File No. 0-08135**

Dear Ms. Bertsch:

We have reviewed your filing and have the following comments. In some of our comments, we may 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. If you do not believe our comments apply to your facts and circumstances, please tell us why in your response.

After reviewing the information you provide in response to these comments, we may have additional comments.

Form 10-K for the Fiscal Year Ended December 31, 2011

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 22

Overview, page 22

1. We note your 2012 outlook disclosure on page 26. To help investors ascertain the likelihood that past performance is indicative of future performance, your MD&A disclosure must provide, among other things, information about the quality of, and potential variability of, your earnings and cash flow. As such, your overview section should address the most important matters on which management focuses in evaluating the company's operating performance and financial condition, and provide context for the discussion of the financial statements. In addition, the overview section should provide

insight into the material opportunities, challenges and risks, such as those presented by known material trends and uncertainties, on which management is most focused, as well as the actions they are taking to address these opportunities, challenges and risks. In this regard, we note that on your Q4 2011 earnings call, management stated that U.S. sales were impacted by funding uncertainties, but that your focus markets of India, China, and Brazil continued to be “a bright spot” with organic growth of 17%. We further note that management discussed certain contributors to your growth, such as the growth in the semiconductor market being influenced by regulations implemented in countries around the world requiring conversion from incandescent lighting to more efficient lighting such as LEDs; your activities in emerging markets and plans for expansion in China and India; and the growth of your zinc finger platform. Please revise your future filings accordingly as we believe that a discussion of this type of information in MD&A would enhance investors’ understanding of the company through the eyes of management. Please see the Commission’s interpretive guidance regarding MD&A disclosures in Release 33-8350 (Dec. 19, 2003) for more information.

Definitive Proxy Statement on Schedule 14A

Compensation Analysis, page 24

Annual Cash Bonus, page 25

2. You disclose that each of Messrs. Wicks’, Cottier’s and Smoller’s individual goals is tied to specific achievements within the business unit for which they are responsible. In this regard, we note that one of Dr. Wicks’ individual goals is the achievement of sales growth targets for strategic alternatives in the Research business units. In light of your disclosure that the organic sales growth result for the Research business was below the threshold, with a view towards future disclosure, please explain to us how the compensation committee determined that the named executive officers met or exceeded the Business Unit/Individual objectives. In addition, please tell us what consideration you have given to quantifying the business unit sales growth targets. Refer to Item 402(b)(2)(v) of Regulation S-K.

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 the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. 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 responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;

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- 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.

You may contact Jessica Kane at (202) 551-3235 or Era Anagnosti at (202) 551-3369 if you have questions regarding these comments.

Sincerely,

/s/ John Cash

John Cash
Accounting Branch Chief