February 12, 2009

VIA EDGAR

U.S. Securities and Exchange Commission
Division of Corporation Finance
100 F Street, NE
Washington, D.C. 20549

Attention: Jim B. Rosenberg

Re: Alexion Pharmaceuticals, Inc.
Form 10-K for the Year Ended December 31, 2007
Filed February 29, 2008
Form 10-Q for the Quarterly Period Ended September 30, 2008
Filed October 30, 2008
Form DEF 14A
Filed on April 4, 2008
File No. 000-27756

Ladies and Gentlemen:

On December 5, 2008, Alexion Pharmaceuticals, Inc. (the "Company") responded ("First Response") to the November 5, 2008 comment letter (the "November 2008 Comment Letter") that the Company received from Jim B. Rosenberg of the Staff (the "Staff") of the Securities and Exchange Commission (the "Commission"). On January 28, 2009, the Company received a comment letter from the Staff regarding the Company's response to the November 2008 Comment Letter.

Set forth below is the Company's response to the Staff's comments received on January 28, 2009, which letter also includes an oral comment received by the Company on January 21, 2009. The Staff comments are italicized and are followed with the Company's response.

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 51

Critical Accounting Policies and the Use of Estimates, page 52

Research and Development Expenses, page 55

1. Please refer to your response to Comment 5. Revise tabular and narrative disclosure included in Exhibit D to include a discussion of R&D costs to date. Please reference the first bullet point of our original comment.

In response to the Staff's Comment, the Company will add a column to its "External Direct Expenses Related to Clinical Development Programs" table in its future reports on Form 10-K listing external direct expenses incurred to date from January 1, 2006. The Company will also add a sentence following the table of "External Direct Expenses Related to Clinical Development Programs" stating the Company's aggregate research and development expenses from the Company's inception in 1992 until January 1, 2006, and that substantially all of such expenses related to two compounds, eculizumab and pexelizumab.

Eculizumab, currently marketed under the brand name Soliris® for the treatment of a rare blood disorder known as PNH was approved for PNH in the United States and Europe in 2007. All pexelizumab programs were terminated in 2006 and are no longer active. The Company did not historically track its internal and external research and development costs for each of pexelizumab and eculizumab on an individual basis. Eculizumab and pexelizumab, both similar monoclonal antibody compounds, were for a number of years developed simultaneously and the Company utilized substantially the same personnel and resources for both compounds. The Company studied and developed its two main compounds for a number of different indications and conducted multiple simultaneous clinical trials in several diseases with respect to each of these compounds. As a result, costs incurred with respect to development of eculizumab and pexelizumab overlapped across multiple development efforts for those two compounds. The Company believes that collection and evaluation of historical information necessary to allocate research and development costs incurred from inception to each of these two compounds would be unduly burdensome and in some cases not possible. The Company also believes that allocation of such expenses cannot be determined with any reasonable certainty as data and information covers a fifteen year period and relates to multiple clinical trials and development efforts.

Given the current status of pexelizumab and eculizumab programs, the Company also believes that such pre-2006 historical information with respect to pexelizumab, the development of which the Company terminated in 2006 and with respect to eculizumab, the marketing approval for which was obtained in 2007 for PNH, may not provide a meaningful benefit to investors. The Company believes that the categorization of more recent research and development projects, as well as the additional disclosures related to total research and development

expenses incurred between 1992 and 2006, would provide investors with meaningful information regarding the Company's development efforts.

DEF 14A

2. Please review your disclosure to include the individual goals, as derived from the corporate goals discussed, used in determining compensation for Drs. Bell and Squinto and Mssrs. Keiser, Sinha and Dubin, as well as qualitative discussion of the extent of achievement of these goals for each named executive officer.

As the Company previously disclosed in its First Response, individual goals for its named executive officers overlap with the Company's corporate goals and consist of the subgoals designed to achieve the corporate goals. For 2008, individual goals for the Company's named executive officers are set forth below.

Dr. Bell's individual goals were identical to the Company's corporate goals and his performance is typically evaluated in the context of the Company's performance. The 2008 corporate goals are set forth in Exhibit F of the First Response and include revenue and expense targets, expansion of clinical development for eculizumab and the Company's other products, and securing a cost-effective supply chain management system.

Mr. Keiser's individual goals were as follows: achieve specific revenue targets in the EU and US commercial operations; reduce manufacturing risk; and secure regulatory compliance.

Dr. Squinto's individual goals were as follows: expand EXPLORE studies; support Japan submissions and registration; assess new indications for eculizumab; and initiate clinical trials.

Mr. Dubin's individual goals were as follows: defend third party litigations; support business development initiatives and conduct intellectual property due diligence; monitor state and federal compliance metrics; support international legal needs; and manage human resources initiatives and operations.

Mr. Sinha's individual goals were as follows: monitor and manage expenses; monitor sales variance reports; conduct quarterly regional business reviews; manage currency risk; support pricing strategy and international structure; and manage IT initiatives and operations.

The Company will disclose annually pre-determined individual goals for its named executive officers in its future proxy statement filings. The Company will also discuss in such future filings the extent of achievement of such goals by its named executive officers and the extent to which the Compensation Committee considered such goals when determining annual incentive awards. The Company will include a quantitative discussion, where appropriate, on the extent of achievement of individual goals.

The Company acknowledges that:

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

Should you have any questions or require additional information, please telephone either Michael Greco (203-271-8336) or the undersigned (203-271-8906).

Very truly yours,

/s/ Vikas Sinha

Vikas Sinha
Senior Vice President and Chief Financial Officer

cc: Leonard Bell, Alexion Pharmaceuticals, Inc.
Thomas Dubin, Alexion Pharmaceuticals, Inc.
Scott Phillips, Alexion Pharmaceuticals, Inc.
Michael Greco, Alexion Pharmaceuticals, Inc.
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