April 15, 2011

VIA EDGAR

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

Attention: Jeffrey P. Riedler

Re: Alexion Pharmaceuticals, Inc.
Form 10-K for the Year Ended December 31, 2010
Filed February 17, 2011

Ladies and Gentlemen:

On behalf of Alexion Pharmaceuticals, Inc. ("Alexion"), submitted herewith is a response to comments contained in the letter dated March 31, 2011 from Jeffrey P. Riedler of the Staff ("Staff"), of the Securities and Exchange Commission ("Commission") to Leonard Bell. M.D., Alexion's Chief Executive Officer. The comments and responses set forth below are keyed to the numbering of the comments and the headings used in the Staff's letter.

On behalf of Alexion, we advise you as follows:

General

1. *We note that you have not yet filed the Part III information that is incorporated by reference into your Form 10-K. We may have further comments after reviewing that information and we will not be able to clear our review of your filing until we have the opportunity to resolve any resulting comments.*

Response: Alexion filed the Part III information with our preliminary proxy statement on April 6, 2011.

2. *Please provide proposed disclosure to be included in your next Form10-K which includes a more robust discussion of your material patents, including the expiration dates for each and the jurisdictions in which they were granted. See Item 101(c)(1)(iv) of Regulation S-K for guidance.*

Response: In order to address the Staff's comment Number 2, in future filings beginning with the Form 10-K for the year ended December 31, 2011, we propose to revise our disclosure in the Business section under the heading "Patents and Proprietary Rights," to read substantially as follows, with revised text underlined in the proposed disclosure:

"Patents and Proprietary Rights

Patents and other proprietary rights are important to our business. Our policy is to file patent applications to protect technology, inventions and improvements to our technologies that are considered important to the development of our business. We also rely upon our trade secrets, know-how, and continuing technological innovations, as well as patents that we have licensed or may license from other parties, to develop and maintain our competitive position.

We have filed several U.S. patent applications and international counterparts of certain of these applications. In addition, we have in-licensed several additional U.S. and international patents and patent applications. As of December 31, 2010, we own or in-license over 62 U.S. patents and 35 U.S. patent applications. These patents and patent applications relate to technologies or products in the C5 Inhibitor program, high throughput screening, vectors, cancer, recombinant antibodies, and other technologies. As of December 31, 2010, we own or in-license 47 foreign patents and 147 pending foreign patent applications.

With respect to Soliris, we have an issued U.S. patent covering Soliris that will expire in 2021, taking into account patent term extension. In Europe, a corresponding issued patent covering Soliris expires in 2015 and, taking into account the Supplementary Certificates of Protection (SPC) that we have filed for in various European countries, exclusivity for Soliris will extend into 2020 in those countries in which an SPC is granted. Patents covering Soliris in Japan and other countries expire between 2015 and 2020. We owe royalties and other fees to owners of one or more patents in connection with the manufacture and sale of Soliris for PNH, and we may owe royalties and fees to other third parties with respect to any previous or future manufacture and sale of Soliris and our product candidates.

We also own U.S. and foreign patents and patent applications for our product candidates other than Soliris. At present, each such product candidate is in early stage development and it is not known whether any such product candidate will ever be approved for human use and sale.

Our success will depend in part on our ability to obtain and maintain U.S. and international patent protection for our products and development programs, to preserve our trade secrets and proprietary rights, and to operate without infringing on the proprietary rights of third parties or having third parties circumvent our rights. Because of the length of time and expense associated with bringing new products through development and regulatory approval to the marketplace, the health care industry has traditionally placed considerable importance on obtaining patent and trade secret protection for significant new technologies, products and processes. Significant legal issues remain to be resolved as to the extent and scope of patent protection for biotechnology products and processes in the United States and other important markets outside of the United States. Accordingly, there can be no assurance that patent applications owned or licensed by us will issue as patents, or that any issued patents will afford meaningful protection against competitors.

Moreover, once issued, patents are subject to challenge through both administrative and judicial proceedings in the United States and in foreign jurisdictions. Such proceedings include interference proceedings before the U.S. Patent and Trademark Office and opposition proceedings before the European Patent Office. Litigation may be required to enforce our intellectual property rights. Any litigation or administrative proceeding may result in a significant commitment of our resources and, depending on outcome, may adversely affect the validity and scope of certain of our patent or other proprietary rights.

We are aware of broad patents owned by others relating to the manufacture, use and sale of recombinant humanized antibodies, recombinant human antibodies, and recombinant human single chain antibodies. Soliris and some of our product candidates are either genetically engineered antibodies, including recombinant humanized antibodies, recombinant human antibodies, or recombinant human single chain antibodies. We have received notices from the owners of patents claiming that their patents may be infringed by the development, manufacture or sale of Soliris or some of our drug candidates. For example, in January 2011, Novartis filed a civil action in the U.S. District Court for the District of Delaware alleging that the manufacture of Soliris infringes their U.S. patent number 5,688,688. We are also aware of other patents owned by third parties that might be claimed by such third parties to be infringed by the development and commercialization of Soliris or some of our product candidates. In respect to some of these patents, we have obtained licenses, or expect to obtain licenses. However, with regard to such other patents, we have determined in our judgment that:

- our products do not infringe the patents;
- the patents are not valid; or
- we have identified and are testing various modifications that we believe should not infringe the patents and which should permit commercialization of our product candidates.

If any patent holder successfully challenges our judgment that our products do not infringe their patents or that their patents are invalid, we could be required to pay costly damages or to obtain a license to sell or develop our drugs. A required license may be costly or may not be available on acceptable terms, if at all. A costly license, or inability to obtain a necessary license, could materially and adversely affect our ability to commercialize our products, including Soliris.

We record actual and estimated royalties to third parties related to the sale and commercial manufacture of Soliris. These estimates are influenced by our assessment of the likelihood of third parties asserting that their patents are infringed by the manufacture or sale of Soliris and the likely outcome of any such assertion. On a periodic basis and based on specific events such as the outcome of litigation, we may reassess these estimates, resulting in adjustments to cost of sales.

It is our policy to require our employees, consultants and parties to collaborative agreements to execute confidentiality agreements upon the commencement of employment or consulting relationships or collaborations with us. These agreements generally provide that all confidential information developed or made known during the course of the relationship with us is to be kept confidential and not to be disclosed to third parties except in specific circumstances. In the case of

employees, the agreements also provide that all inventions resulting from work performed for us, utilizing our property or relating to our business and conceived or completed by the individual during employment shall be our exclusive property to the extent permitted by applicable law."

Alexion acknowledges that:

- Alexion 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
- Alexion 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 the undersigned at (203) 271-8336.

Very truly yours,

/s/ Michael V. Greco

Michael V. Greco
Associate General Counsel and Corporate Secretary

cc: Leonard Bell, Alexion Pharmaceuticals, Inc.
Vikas Sinha, Alexion Pharmaceuticals, Inc.
Thomas Dubin, Alexion Pharmaceuticals, Inc.
Patrick O'Brien, Ropes and Gray LLP