VIA EDGAR

March 10, 2016

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 Fiscal Year Ended December 31, 2015
Filed February 8, 2016
File No. 0-27756

Ladies and Gentlemen:

On behalf of Alexion Pharmaceuticals, Inc. ("Alexion"), submitted herewith is a response to comments contained in the letter dated February 25, 2016 from Mr. Jim B. Rosenberg of the Staff ("Staff") of the Securities and Exchange Commission ("Commission") to Mr. Vikas Sinha, Alexion's Executive Vice President and Chief Financial 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:

Notes to Consolidated Financial Statements
2. Acquisitions, page F-17

1. *You state that you recorded approximately $40.7 million of adjustments to the amounts initially recorded for the assets acquired and liabilities assumed as of the acquisition date, which primarily related to the valuation of acquired inventory and the assessment of inventory related items. Refer to ASC 805-10-30-2 through 30-3. Please tell us the following:*

- *The amount of the measurement period adjustments related to the valuation of acquired inventory vs. the assessment of inventory related items.*

Response: The amount of the measurement period adjustments related to the valuation of acquired inventory was $37.8 million, and the amount of the measurement period adjustments related to the assessment of inventory related items was $11.1 million. These adjustments were offset by other individually insignificant adjustments aggregating to $8.2 million.

- *What is meant by the "assessment of inventory-related items"*

Response: The assessment of inventory-related items relates to the review of prepayments for inventory and accruals for inventory associated with contractual obligations due to third party manufacturers that existed at the acquisition date which were impacted by additional information received subsequent to the acquisition date.

- *The timing and nature of the new information received that resulted in each measurement period adjustment.*

Response: During the third and fourth quarter 2015, we received information (further discussed below) regarding two items associated with the inventory acquired in the acquisition of Synageva Biopharma Inc. (Synageva). Both items related to factors that existed prior to the acquisition and resulted in measurement period adjustments.

The first item related to results of the quality release process for batches of Kanuma that were produced prior to June 22, 2015, for which the quality release process was not completed at the time of the acquisition. The second item related to information regarding the results of an FDA inspection that occurred prior to June 22, 2015 of a Synageva third-party contract manufacturer providing vial filling services.

- *An analysis of the new information received demonstrating that it related to events or circumstances that existed at the acquisition date. Address in your analysis your consideration of events occurring after the acquisition date related to Kanuma such as obtaining regulatory approval and the FDA's three month extension of the Prescription Drug User Fee Act date for its priority review for Kanuma's biologics license application.*

Response: Analysis of the new information regarding the two inventory issues is as follows:

Inventory Item #1

On June 22, 2015, we acquired all of the inventory of Synageva. On the date we acquired the inventory, several batches of bulk drug substance were already undergoing the quality release process. In the third quarter 2015, we received the results of the quality review process for these batches, and the results showed that the batches did not pass the quality release process, which is required before the inventory can be sold. Following an investigation of these batches, we determined that a third party contract manufacturer's purification process had been contaminated prior to June 22, 2015. Production was then shut down in order to conduct remediation activities. As a result of these conditions, we reduced the value of the inventory acquired by $10.6 million to reflect a zero value for these batches that were produced prior to the acquisition date and for raw materials that could not be consumed.

In addition to the reduction of the fair value of inventory, prepayments and accruals related to this inventory were reviewed to determine the contractual liability we assumed for this inventory. This resulted in the measurement period adjustment related to the assessment of inventory-related items of $11.1 million.

Inventory Item #2

The Biologics License Application (BLA) for U.S. marketing approval of Kanuma was under review by the FDA at the time of the closing of the Synageva acquisition. Prior to the closing of the acquisition, the FDA inspected Synageva's third party contract manufacturer (CMO) for vial filling of Kanuma and issued a Form 483 to Synageva. Prior to the closing, we reviewed the Form 483 (redacted) and the CMO's response to the FDA and we evaluated how and when the observations would be adequately addressed in advance of the PDUFA date.

In November 2015, following a series of discussions with the FDA concerning the observations identified during their inspection of the CMO that occurred prior to the closing of the Synageva acquisition, we filed an amendment to the Kanuma BLA to remove the CMO. As a result of these factors that existed as of the acquisition date, we determined that $27.2 million of the Kanuma inventory vialed by the CMO did not have any future economic benefit as of June 22, 2015 as it could not be sold commercially.

- *The amount of the "reasonable profit allowance at June 30, September 30 and December 31, what specific efforts of the company after acquisition it represented, and why you believe if was reasonable at each date.*

Response: We determined the fair value of inventory acquired in the acquisition of Synageva in accordance with ASC 820. The fair value was measured by the net realizable value of the inventory, computed from the expected selling price of the inventory, adjusted for incremental costs to get the inventory ready for sale, costs for disposal, including direct selling efforts, and a reasonable profit allowance for our completion and selling efforts. The reasonable profit allowance was approximately 37% of the expected selling price at June 30, September 30 and December 31, 2015. We believe this percentage is reasonable as it represents the allocation of the total profit (gross profit less selling expenses) of 69% expected to be realized on the inventory that is attributable to our efforts to get the inventory ready for sale and to sell the inventory.

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Alexion acknowledges the following:

- Alexion is responsible for the adequacy and accuracy of the disclosure in the 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 filings; and
- Alexion may not assert Staff comments as a defense in any proceedings 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) 250-6358.

Very truly yours,

/s/ Daniel A. Bazarko

Daniel A. Bazarko
Senior Vice President and Chief Accounting Officer
Alexion Pharmaceuticals, Inc.

cc. David Hallal, Chief Executive Officer, Alexion Pharmaceuticals, Inc.
Vikas Sinha, EVP and Chief Financial Officer, Alexion Pharmaceuticals, Inc.
John Moriarty, EVP and General Counsel, Alexion Pharmaceuticals, Inc.
Michael Greco, SVP of Law and Corporate Secretary, Alexion Pharmaceuticals, Inc.
Patrick O'Brien, Ropes and Gray, LLP
Owen Davis, PricewaterhouseCoopers, LLP