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

DIVISION OF
CORPORATION FINANCE

December 19, 2014

Via E-Mail
Rob Hadfield, Esq.
General Counsel
Flex Pharma, Inc.
800 Boylston Street, 24th floor
Boston, MA 02110

Re: Flex Pharma, Inc.
Amendment No. 1 to Draft Registration Statement on Form S-1
Submitted December 8, 2014
CIK No. 0001615219

Dear Mr. Hadfield:

We have reviewed your amended draft registration statement 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 by providing the requested information and either submitting an amended draft registration statement or publicly filing your registration statement on EDGAR. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing the information you provide in response to these comments and your amended draft registration statement or filed registration statement, we may have additional comments.

Prospectus Summary
Product Development, page 3

1. Please modify your description of the company throughout the prospectus to remove all references to the company being a "biopharmaceutical company" when you have no pharmaceuticals currently undergoing clinical trials and no definitive plans to do so. Further, remove the drug products appearing in the table entitled "Drug Product Candidates Development Plans" on page 4 and elsewhere in the prospectus. The development of your product as a drug is too uncertain at this time to give it such prominence. We note, however, that it is appropriate for you to discuss possible plans to pursue a drug pathway in the text after you discuss your ongoing efforts to develop the product as a dietary supplement.

Risk Factors
Clinical development involves…, page 16

2. In the first sentence of the second paragraph of the risk factor on page 16, you now state that you "are currently developing drug product candidates for the treatment of nocturnal leg cramps and spasms associated with severe neuromuscular conditions." You should eliminate this sentence and any similar disclosure throughout the prospectus. The studies you are planning will test the product in its dietary supplement form and you have not yet made the decision to pursue the development of your product as a drug which will require reformulation and more rigorous clinical study. It is acceptable to say that you may develop the product as a drug in the future pending the results of your planned proof-of-concept study.

If you intend to respond to these comments with an amended draft registration statement, please submit it and any associated correspondence in accordance with the guidance we provide in the Division's October 11, 2012 announcement on the SEC website at http://www.sec.gov/divisions/corpfin/cfannouncements/drsfilingprocedures101512.htm.

Please keep in mind that we may publicly post filing review correspondence in accordance with our December 1, 2011 policy (http://www.sec.gov/divisions/corpfin/cfannouncements/edgarcorrespondence.htm).

If you intend to use Rule 83 (17 CFR 200.83) to request confidential treatment of information in the correspondence you submit on EDGAR, please properly mark that information in each of your confidential submissions to us so we do not repeat or refer to that information in our comment letters to you.

You may contact Scott Wuenschell at (202) 551-3705 or Mark Brunhofer at (202) 551-3638 if you have questions regarding comments on the financial statements and related matters. Please contact Preston Brewer at (202) 551-3969 or me at (202) 551-3715 with any other questions.

Sincerely,

/s/ Jeffrey P. Riedler

Jeffrey P. Riedler
Assistant Director

cc: Via E-Mail
Marc Recht, Esq.
Cooley LLP