



DIVISION OF
CORPORATION FINANCE

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

July 29, 2014

Via E-mail

Joshua H. Bilenker, M.D.
President
Loxo Oncology, Inc.
One Landmark Square, Suite 1122
Stamford, Connecticut 06901

**Re: Loxo Oncology, Inc.
Registration Statement on Form S-1/A
Amended on July 21, 2014
File No. 333-197123**

Dear Dr. Bilenker:

We have reviewed your registration statement and have the following comment. Please respond to this letter by amending your registration statement and providing the requested information. If you do not believe our comment applies to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to this comment, we may have additional comments.

Use of Proceeds, page 49

Capitalization, page 51

Dilution, pages 53-56

1. We note that the indication of interest in purchasing shares, by NEA's affiliate, is not a binding agreement or commitment to purchase. Absent a firm commitment, you should not give effect to the private placement in your Use of Proceeds, Capitalization, or Dilution disclosures. Please revise your disclosures to limit the assumed receipt of proceeds to the extent of the firm commitment from the underwriters or advise us and clarify your disclosures concerning the nature of NEA's

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commitment.

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 Act of 1933 and all applicable Securities 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.

You may contact Kenya Gumbs, Staff Accountant, at (202) 551-3373, or Robert S. Littlepage, Accountant Branch Chief, at (202) 551-3361, if you have questions regarding comments on the financial statements and related matters. Please contact Paul Fischer, Attorney-Advisor, at (202) 551-3415, Kathleen Krebs, Special Counsel, at 202-551-3350, or me at (202) 551-3810, with any other questions.

Sincerely,

/s/ Robert S. Littlepage, for

Larry Spirgel
Assistant Director

Cc: Robert A. Freedman, Esq.
Fenwick & West LLP