



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

DIVISION OF
CORPORATION FINANCE

Mail Stop 4546

November 14, 2016

Joshua H. Bilenker, M.D.
Chief Executive Officer
Loxo Oncology, Inc.
281 Tresser Blvd., 9th Floor
Stamford, CT 06901

**Re: Loxo Oncology, Inc.
Registration Statement on Form S-3
Filed November 2, 2016
File No. 333-214392**

Dear Dr. Bilenker:

This is to advise you that we have not reviewed and will not review your registration statement.

Please refer to Rules 460 and 461 regarding requests for acceleration. We remind you that the company and its management are responsible for the accuracy and adequacy of their disclosures, notwithstanding any review, comments, action or absence of action by the staff.

Please contact Dorrie Yale at 202-551-8776 or Erin Jaskot, Special Counsel, at 202-551-3442 with any questions.

Sincerely,

/s/ Erin K. Jaskot, *for*

Suzanne Hayes
Assistant Director
Office of Insurance and Healthcare

cc: Julia Forbess, Fenwick & West LLP