



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

DIVISION OF
CORPORATION FINANCE

February 4, 2019

Anthony G. Quinn, M.B Ch.B, Ph.D.
Chief Executive Officer
Aeglea BioTherapeutics, Inc.
901 S. MoPac Expressway
Barton Oaks Plaza One
Suite 250
Austin, TX 78746

Re: Aeglea BioTherapeutics, Inc.
Registration Statement on Form S-3
Filed December 21, 2018
File No. 333-228967

Dear Dr. Quinn:

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 Irene Paik at 202-551-6553 with any questions.

Sincerely,

Division of Corporation Finance
Office of Healthcare & Insurance

cc: Robert A. Freedman, Esq. - Fenwick & West LLP