



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

DIVISION OF  
CORPORATION FINANCE

Mail Stop 4631

December 6, 2017

Via E-Mail

Dr. Oliver P. Peoples  
President & Chief Executive Officer  
Yield10 Bioscience, Inc.  
19 Presidential Way  
Woburn, Massachusetts 01801

**Re: Yield10 Bioscience, Inc.  
Amendment No. 1 to Registration Statement on Form S-1  
Filed November 22, 2017  
File No. 333-221283**

Dear Dr. Peoples:

We have reviewed your amended 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.

Underwriting, page 54

Over-allotment Option, page 56

1. We note your response to comment 1 in our letter dated November 16, 2017. Please reconcile your response that the underwriters may use their over-allotment option to engage in stabilization of the price of Yield10 Bioscience's common stock with your disclosure on the cover page and page 56 of the prospectus that the underwriters may exercise their over-allotment option "solely" to cover over-allotments. In this regard, we also note that your disclosure under the section "Stabilization, Short Positions and Penalty Bids" on page 57 does not refer to the overallotment option being utilized for stabilization. Please also revise your prospectus to specify whether the underwriters would still engage in stabilization of the price of Yield10 Bioscience's common stock in the event that the available securities under the over-allotment option must be used to cover over-subscriptions and, if so, how would such purchases of common stock for stabilization be priced.

Dr. Oliver P. Peoples  
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Please contact Frank Pigott (Staff Attorney) at 202-551-3570 or me at 202-551-3765 with any questions.

Sincerely,

/s/ Pamela Long

Pamela Long  
Assistant Director  
Office of Manufacturing and  
Construction

cc: Megan Gates  
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.