



DIVISION OF
CORPORATION FINANCE

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

April 2, 2013

Via E-mail

Michael R. Bristow
President and Chief Executive Officer
ARCA biopharma, Inc.
8001 Arista Place, Suite 430
Broomfield, CO 80021

**Re: ARCA biopharma, Inc.
Registration Statement on Form S-1
Filed March 25, 2013
File No. 333-187508**

Dear Mr. Bristow:

We have limited our review of your registration statement to those issues we have addressed in our 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 amending your registration statement and providing the requested information. Where 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 any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

Executive Compensation, page 38

1. We note your inclusion of a summary compensation table in this section pursuant to Item 402(n) of Regulation S-K. Please provide the additional disclosure in this section that is required under Item 402(o)-(r), as well as any other information required under Item 402 that is applicable to your company.

Incorporation of Certain Information by Reference, page 51

2. Please revise to incorporate by reference all Form 8-Ks filed since the fiscal year ended December 31, 2012 as required by General Instruction VII and Item 12 of Form S-1. We refer you to Question 113.05 of the Securities Act Forms Compliance and Disclosure Interpretations.

Undertakings, page II-6

3. Please revise your disclosure to include all applicable undertakings required under Item 512(a) and 512(h) of Regulation S-K.

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.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

Michael R. Bristow
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Please contact Austin Stephenson at (202) 551-3192, Daniel Greenspan at (202) 551-3623, or me at (202) 551-3715 with any questions.

Sincerely,

/s/ Daniel Greenspan for

Jeffrey P. Riedler
Assistant Director

cc: Via E-mail
Brent D. Fassett, Esq.
Cooley LLP