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July 3, 2024

VIA EDGAR AND ELECTRONIC TRANSMISSION

U.S. Securities and Exchange Commission
Division of Corporation Finance
Office of Life Sciences
100 F Street, NE
Washington, DC 20549

Attention: Eric Atallah
Vanessa Robertson
Jimmy McNamara
Joshua Gorsky

Re: **BioAge Labs Inc.**
Draft Registration Statement on Form S-1
Submitted May 31, 2024
CIK No. 0001709941

Ladies and Gentlemen:

We are submitting this letter on behalf of BioAge Labs, Inc. (the "***Company***") in response to the comments of the staff (the "***Staff***") of the U.S. Securities and Exchange Commission (the "***Commission***") contained in the Staff's letter dated June 28, 2024 (the "***Letter***"), regarding the Company's Draft Registration Statement on Form S-1 (CIK No. 0001709941) confidentially submitted by the Company to the Commission on May 31, 2024 (the "***Draft Registration Statement***"). Concurrently herewith, we are transmitting Confidential Submission No. 2 ("***Draft No. 2***") to the Draft Registration Statement. The numbered paragraphs below correspond to the numbered comments in the Letter and the Staff's comments are presented in bold italics.

In addition to addressing the comments raised by the Staff in the Letter, the Company has revised Draft No. 2 to update certain other disclosures. Capital terms used and not otherwise defined herein have the same meanings as specified in Draft No. 2.

Draft Registration Statement on Form S-1
Overview, page 1

1. ***We note that disclosures here, and elsewhere in the prospectus, include statements or implications that your product candidates are safe and/or effective. Please revise these statements, as safety and efficacy determinations are in the exclusive purview of the FDA or other regulators. For example only, the following statements improperly state or imply that your product candidates are safe or effective:***

    - ***On page 1, that azelaprag "prevented muscle atrophy, preserved muscle quality and improved metabolism."***
    - ***On page 2, that azelaprag "can recapitulate many of the benefits of exercise."***
    - ***On page 3, that azelaprag can "mimic some global effects of exercise at the protein level."***
    - ***On page 120, that azelaprag "significantly prevented [ ] bed-rest induced muscle atrophy [.]"***
    - ***On page 121, that azelaprag "prevented the decrease in thigh circumference [ ], as well as in muscle diameter and thickness [.]"***

In response to the Staff's comment, the Company has revised its disclosures on pages 1, 3, 4, 87, 107, 110, 123, 124, 126, 128, 129, 135, 136, 137, 138, 139 and 140 of Draft No. 2.

2. ***We note your disclosure here, and on page 3, that in preclinical obesity models, azelaprag demonstrated the ability to more than double the weight loss induced by a glucagon-like-peptide-1 receptor (GLP-1R) agonist while also restoring healthy body composition and improving muscle function. Please provide balancing disclosure with your statement on page 20 that results of earlier studies and trials may not be predictive of future trial results.***

In response to the Staff's comment, the Company has revised its disclosures on pages 1, 4, 87, 107 and 111 of Draft No. 2 to provide additional balancing disclosure to clarify that results of earlier studies and trials may not be predictive of future trial results.

Our approach: Targeting human aging biology to treat chronic metabolic diseases, page 1

3. ***Please ensure the text of the graphic is legible on page 2.***

In response to the Staff's comment, the Company has revised its disclosure on page 2 of Draft No. 2 with an updated graphic to increase the font size and the overall size of the graphic.

4. Please specify, if true, that the $150 billion estimate on page 2 refers to a global market, or otherwise advise.

In response to the Staff's comment, the Company has revised its disclosures on pages 3, 109 and 115 of Draft No. 2 to clarify that the $150 billion estimate refers to the global market for GLP-1R agonists.

Our lead product candidate, azelaprag; an orally available, small molecule APJ agonist…, page 3

5. Please specify the number of volunteers in the Phase 1b clinical trial.

In response to the Staff's comment, the Company has revised its disclosures on pages 4 and 110 of Draft No. 2 to specify the number of volunteers in the Phase 1b clinical trial.

Our second product candidate, BGE-100, is a novel, orally available, brain-penetrant inhibitor of NLRP3, a key target for neuroinflammation, page 6

6. Please provide the basis for the statement that inactivation of NLRP3 in mice has been shown to significantly extend lifespan, with sustained physical and cognitive function. In addition, please quantify the mice tested, or otherwise advise.

In response to the Staff's comment, the Company has revised its disclosure on page 145 of Draft No. 2 to quantify the mice tested. The revised disclosure also clarifies that the lifespan and healthspan benefits of NLRP3 genetic inactivation have been described in multiple third-party publications, including Marin-Aguilar, et al., 2020, which published an experiment showing that knockout of the NLRP3 gene in mice significantly extended lifespan. Other such third party publications include McBride 2017, which noted that NLRP3 knockout mice had preserved muscle and function, as measured by wire hang latency to fall, and Khilazheva 2023, which provided that NLRP3 knockout mice had preserved contextual memory.

Risk Factors
Risks Related to Our Reliance on Third Parties
The manufacture of pharmaceutical products, including our product candidates…, page 43

7. We note your disclosure that you "currently contract with certain third-party manufacturers, which are located in China" and that "since some of [y]our third-party manufacturers are located in China, [you] are exposed to the possibility of product supply disruption and increased costs in the event of changes in the policies of the United States or Chinese governments[.]" We also note your disclosure regarding the BIOSECURE Act. Please revise your disclosure to clarify whether any of the third-party manufacturers that you currently contract with have been named as "companies of concern" in the current U.S. House of Representatives version of the BIOSECURE Act.

In response to the Staff's comment, the Company has revised its disclosures on pages 44 and 45 of Draft No. 2 to clarify that WuXi Apptec and its affiliates, the Company's third-party manufacturers located in China, are considered to be "biotechnology companies of concern" as defined in the current U.S. House of Representatives version of the BIOSECURE Act.

Market and Industry Data, page 77

8. We note your statement that investors are cautioned not to give "undue weight" to market estimates and projections. This statement appears to imply a disclaimer of

responsibility for this information in the registration statement. Please either revise this section to remove such implication or specifically state that you are liable for all information in the registration statement.

In response to the Staff's comment, the Company has revised its disclosure on page 78 of Draft No. 2.

Management's Discussion and Analysis of Financial Condition and Results of Operations
Critical Accounting Policies and Estimates
Stock-Based Compensation, page 99

9. Once you have an estimated offering price or range, please explain to us how you determined the fair value of the common stock underlying your equity issuances and the reasons for any differences between the recent valuations of your common stock leading up to the initial public offering and the estimated offering price. This information will help facilitate our review of your accounting for equity issuances including stock compensation. Please discuss with the staff how to submit your response.

The Company respectfully acknowledges the Staff's comment and will supplementally provide the requested information when available.

Our Strategy, page 112

10. Please remove the reference to "[p]otential first- and best-in-class APJ agonist" in the graphic as such descriptions imply an expectation of regulatory approval and are inappropriate given the length of time and uncertainty with respect to securing marketing approval.

In response to the Staff's comment, the Company has revised its disclosure within the graphic on page 114 of Draft No. 2 to remove the reference to "[p]otential first- and best-in-class APJ agonist."

Completed clinical trials, page 119

11. Please provide a more fulsome discussion of the seven Phase 1 trials, including when such trials occurred, and the specific dosing. In addition, please clearly disclose the primary and secondary endpoints, if any, and whether they were achieved.

In response to the Staff's comment, the Company has revised its disclosure on page 121 of Draft No. 2 to include a more fulsome discussion of the seven Phase 1 trails, including disclosure on whether the primary and secondary endpoints were achieved.

12. We note your use of p-value on page 120, and elsewhere in the prospectus. At first use, please provide a brief explanation of the disclosed p-value and how it is used to measure statistical significance.

In response to the Staff's comment, the Company has revised its disclosure on page 119 of Draft No. 2.

13. With respect to the Phase1b clinical trial on page 120, please clarify whether the three referenced "endpoints" were primary or secondary.

In response to the Staff's comment, the Company has revised its disclosure on page 122 of Draft No. 2 to clarify that the referenced "endpoints" were secondary.

Azelaprag for obesity: Genetic evidence supports the potential of azelaprag to improve metabolism…, page 125

14. With respect to the genetic studies of apelin in mice, please disclose whether you conducted such studies, the number of mice tested, and whether the observations were statistically significant.

In response to the Staff's comment, the Company has revised its disclosure on pages 127 and 128 of Draft No. 2 to clarify that external groups conducted studies of apelin in mice, including the specifics of the number of mice tested and whether the observations were statistically significant.

Preclinical results in a diet-induced obesity model demonstrate the potential of azelaprag…, page 132

15. With respect to the preclinical trials, please disclose the number of mice tested, and whether the results were statistically significant.

In response to the Staff's comment, the Company has revised its disclosure on page 135 of Draft No. 2 to specify the number of mice tested and to clarify whether the results were statistically significant.

Indication expansion opportunities, page 141

16. We note your disclosure regarding "robust evidence" indicating that "apelin has the potential to directly improve insulin sensitivity and glucose control" and "[r]obust preclinical evidence" indicating that "apelin signaling may have the potential to improve cardiac function in patients with heart failure." In both instances, please provide further details about the clinical studies and preclinical work that you reference in this section, including, but not limited to, who conducted the studies, what was observed, and whether the findings were statistically significant.

In response to the Staff's comment, the Company has revised its disclosure on page 143 of Draft No. 2 to include additional detail about each of the referenced clinical studies and preclinical work.

Approach for identifying novel targets based on unique insights into human aging biology, page 144

17. We note you have negotiated "favorable agreements" with biobanks, including SomaLogic and Metabolon, as well as your disclosure on page 2 that you have "exclusive access" to serial biobanked human samples. Please describe the material terms of the agreements with each biobank, and file each agreement as an exhibit pursuant to Item 601(b)(10) of Regulation S-K or explain the basis for your determination that filing is not required.

In response to the Staff's comment, the Company respectfully advises the Staff that the Company considers these agreements to be made in the ordinary course of its business. The Company does not consider itself to be substantially dependent upon any one agreement to access a data repository, and, accordingly, does not consider any such agreements as a material contract within the meaning of Item 601(b)(10) of Regulation S-K. Should any of these agreements be terminated, the Company could seek access to clinically linked multi-omic data generated by the Company as well as by other repositories, and the termination would not have any material impact on the Company's current clinical development programs. The Company further advises the Staff that it does not believe that additional disclosure regarding the individual terms or the filing of any of the agreements governing access to data repositories, is necessary to provide investors with an appropriate understanding of the Company.

Material Agreements
Exclusive License Agreement with Amgen Inc., page 146

18. Please clarify whether the Series C redeemable convertible preferred stock held by Amgen pursuant to the Amgen Agreement will be converted into common stock as a result of the offering and, if the Series C shares will be converted, please disclose the number of shares of common stock that Amgen will hold.

In response to the Staff's comment, the Company has revised its disclosure on pages 90 and 150 of Draft No. 2.

Intellectual Property
Azelaprag Program, page 149

19. With respect to the in-licensed 10 patent families from Amgen Inc., please provide the patent expiration dates and expected expiration dates on an individual or family basis

for the non-US pending patent applications. In addition, with respect to the BGE-100 Program's seven patent families and the Platform Technology and Discovery Program's four patent families, please disclose the patent expiration dates and expected expiration dates on an individual or family basis for the pending patent applications.

In response to the Staff's comment, the Company has revised its disclosure on pages 153 and 154 of Draft No. 2.

20. We note your disclosure on page 150 that you have in-licensed one patent family from the Institut National De La Sante Et De La Recherche Medicale (INSERM) relating to use of the class of apelin receptor agonists for treating sarcopenia. Please describe the material terms of the license agreement, and file the agreement as an exhibit pursuant to Item 601(b)(10) of Regulation S-K or explain the basis for your determination that filing is not required.

In response to the Staff's comment, the Company respectfully advises the Staff that, while the Company obtained the right to develop and commercialize BGE-105 (azelaprag) for sarcopenia, the Company is not currently developing azelaprag for sarcopenia, and the INSERM license is only defensive in nature. As such, the Company not does not consider itself to be substantially dependent upon the INSERM Agreement, and, accordingly, does not consider the INSERM Agreement to be a material contract within the meaning of Item 601(b)(10) of Regulation S-K. The Company further advises the Staff that it does not believe that additional disclosure regarding the individual terms or the filing of the INSERM Agreement is necessary to provide investors with an appropriate understanding of the Company.

General

21. Please provide us with supplemental copies of all written communications, as defined in Rule 405 under the Securities Act, that you, or anyone authorized to do so on your behalf, have presented or expect to present to potential investors in reliance on Section 5(d) of the Securities Act, whether or not you retained, or intend to retain, copies of the communications.

The Company respectfully acknowledges the Staff's comment and will supplementally provide to the Staff a copy of the corporate presentation slide deck that has been presented virtually, but not distributed, to potential investors in "testing-the-waters" meetings in reliance on Section 5(d) of the Securities Act of 1933, as amended. The Company respectfully requests the Staff destroy such materials upon completion of its review. To the extent that any written communications may in the future be presented to additional potential investors, the Company will provide the Staff with copies of any such written communication.

* * * * * * *

Should the Staff have additional questions or comments regarding the foregoing, please do not hesitate to contact me at (415) 875-2420, or in my absence, Robert Freedman at (206) 389-4524.

Sincerely,

/s/ Julia Forbess
Julia Forbess
Partner

FENWICK & WEST LLP

cc:

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