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June 15, 2018

VIA FEDERAL EXPRESS AND EDGAR

United States Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549
Attention:
Rolf Sundwall
Jim Rosenberg
Dorrie Yale
Suzanne Hayes

Re: AVROBIO, Inc.
Amendment No. 2 to Registration Statement on Form S-1
File No. 333-225213
CIK No. 0001681087

Ladies and Gentlemen:

This letter is being submitted on behalf of AVROBIO, Inc. (the "Company") in response to comments of the Staff (the "Staff") of the U.S. Securities and Exchange Commission (the "Commission") with respect to the above-referenced Amendment No. 2 to Registration Statement (the "Registration Statement") that was filed with the Commission on June 11, 2018, as set forth in the Staff's letter to the Company dated June 13, 2018 (the "Comment Letter").

For reference purposes, the text of the Comment Letter has been reproduced herein with responses below each numbered comment. For your convenience, we have italicized the reproduced Staff comments from the Comment Letter. Unless otherwise indicated, page references in the descriptions of the Staff's comments and in the responses refer to the Registration Statement. All capitalized terms used and not otherwise defined herein shall have the meanings set forth in the Registration Statement.

For the Staff's convenience and to facilitate the Staff's analysis of the Comment Letter, the Company's responses below do not give the effect to the 1-for-4.132 reverse stock split that was completed on June 7, 2018, as described in the Registration Statement.

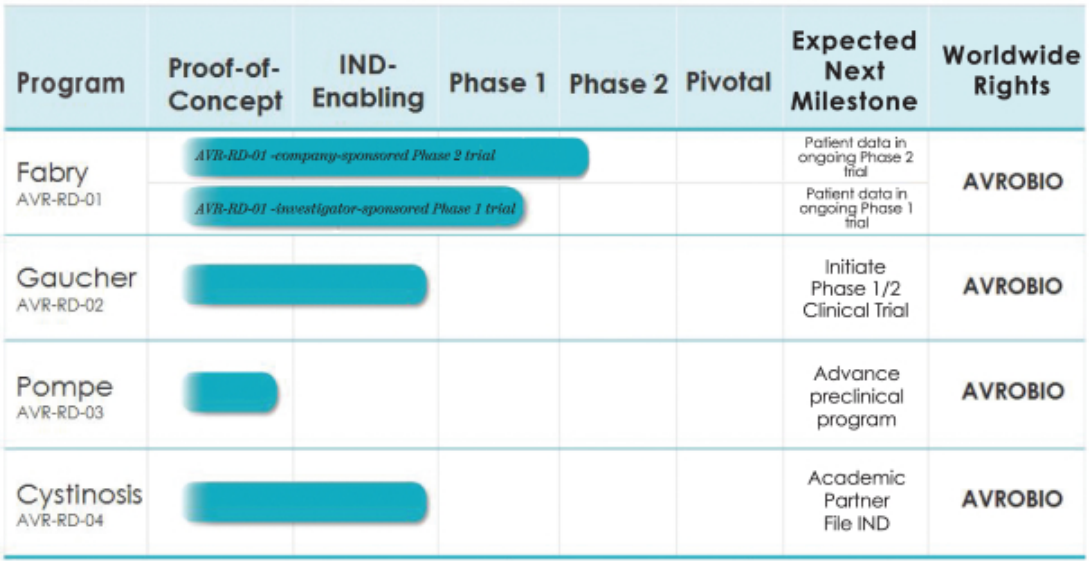
The responses provided herein are based upon information provided to Goodwin Procter LLP by the Company. In addition to submitting this letter via EDGAR, we are sending via Federal Express four (4) copies of this letter.

Amendment No. 2 to Registration Statement on Form S-1 Submitted on June 11, 2018

Prospectus Summary, page 1

1. *We note your revised disclosure that you have initiated a Phase 2 trial for AVR-RD-01, and that the "Expected Next Milestone" column in your revised pipeline table now states that the next step for this product candidate is to receive the first phase 2 patient data. We also note your disclosure on pages 16-17 that both the Phase 1 and Phase 2 trials for AVR-RD- 01 are ongoing and need to be completed. Please revise your pipeline table here and in the Business section to clarify that the Phase 1 trial has not been completed and that the expected next milestone includes receiving patient data from both the Phase 1 and Phase 2 trials.*

RESPONSE: The Company respectfully advises the Staff that it will revise its disclosures on pages 2, 89 and 95 in a future amendment to the Registration Statement in response to the Staff's comment to include a pipelines table substantially in the form of the below graphic.



Use of Proceeds, page 59

2. *We note your disclosure that you estimate that you will use the proceeds from the offering, together with your existing cash, to advance AVR-RD-01 into Phase 2 clinical trials and to support the phase 1 clinical trial; to advance AVR-RD-02 into Phase 1/2 clinical trials; AVR-RD-03 into preclinical development; etc. Please revise your disclosure to clarify whether you expect to complete any of these trials with the proceeds from the offering and existing cash. If not, please clarify that you do not expect the proceeds to be sufficient to complete any of these phases.*

RESPONSE: The Company respectfully advises the Staff that it will revise its disclosures on page 59 in a future amendment to the Registration Statement in response to the Staff's comment to clarify that, based on the Company's current plans, the Company believes that the amounts allocated as described on page 59 under Use of Proceeds are sufficient for the completion of the ongoing Phase 1 and Phase 2 clinical trials for AVR-RD-01, but are insufficient to complete the studies and trials for AVR-RD-02, AVR-RD-03 and AVR-RD-04 or subsequent clinical trials of AVR-RD-01. The Company supplementally advises the Staff that it expects that such disclosure to be in substantially the form set forth below.

We currently estimate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents of $57.9 million as of March 31,2018, as follows:

- approximately $13.4 million to fund expenses for our lead product candidate, AVR-RD-01, for the treatment of Fabry disease in our ongoing Phase 2 clinical trial and to support the ongoing investigator-sponsored Phase I clinical trial;
- approximately $12.9 million to fund expenses to advance AVR-RD-02 for the treatment of Gaucher disease into Phase 1/2 clinical trials;
- approximately $3.2 million to fund expenses to advance AVR-RD-03 for Pompe disease further into preclinical development;
- approximately $5.4 million to fund expenses to advance AVR-RD-04 for the treatment of cystinosis, including to support the planned initial investigator-sponsored Phase 1/2 clinical trial;
- approximately $28.0 million to fund expenses for our external and internal manufacturing and process development activities related to the advancement of our product candidates;
- approximately $32.6 million to fund research and development activities that relate to all of our clinical and preclinical activities, including the cost of research and development personnel; and
- the remainder for planned general and administrative expenses, the costs of operating as a public company, working capital and other general corporate purposes.

Based on our current plans, we expect that the proceeds allocated as described above will be sufficient to complete the ongoing Phase 1 and Phase 2 clinical trials for AVR-RD-01, but will be insufficient to complete the above referenced trials and studies for AVR-RD-02, AVR-RD-03 and AVR-RD-04 or subsequent clinical trials of AVR-RD-01. Based on our current plans, we believe our existing cash and cash equivalents, together with the net proceeds from this offering, will be sufficient to fund our operations into 2020.

The Company supplementally advises the Staff that, as disclosed in the Use of Proceeds section of the Registration Statement, the amounts and timing of its expenditures may vary significantly due to inherent uncertainty of clinical development and the numerous factors discussed in the Risk Factors section of the Registration Statement. For the foregoing reasons, the Company respectfully advises the Staff that it believes specifically quantifying at this time the funds needed to complete studies or trials for AVR-RD-02, AVR-RD-03 and AVR-RD-04 would be premature and speculative.

Business
Phase 2 Multinational Clinical Trial, page 99

3. *Please explain to us your revised disclosure, which indicates that you commenced your Phase 2 trial in Australia, but that you received regulatory approval to proceed from Canada*.

RESPONSE: The Company respectfully advises the Staff that it will revise its disclosures on page 99 in a future amendment to the Registration Statement in response to the Staff's comment. The Company supplementally advises the Staff that it expects that such disclosure to be in substantially the form set forth below.

Phase 2 Multinational Clinical Trial

On June 7, 2018, we dosed the first patient in our open label, multinational Phase 2 clinical trial of AVR-RD-01 in 2018. Enrollment in our Phase 2 clinical trial is ongoing, and we expect to enroll eight to 12 treatment-naïve males, 16 years and older, with classic Fabry disease. Our objectives for this trial are to assess safety and efficacy as measured by multiple indicators, such as Gb3 levels in various tissues, kidney and cardiac function, gastrointestinal symptoms, and pain and quality of life scores. All enrolled patients will receive a single treatment with AVR-RD-01 and will be followed for 48 weeks to measure safety and efficacy. We received approval from both the Australian and Canadian regulatory authorities to initiate our Phase 2 clinical trial for AVR-RD-01, and, on June 7, 2018, the first patient in this clinical trial was dosed at an Australian site. We also plan to submit applications to allow commencement of clinical trials in the United States to the FDA and in Japan to the Pharmaceuticals and Medical Devices Agency, or PMDA, following meetings with each of these respective regulatory authorities.

Letter dated June 1, 2018 regarding determination of fair value of the Company's common stock Valuations, page 3

4. *Refer to your response to Comment 2 from our June 8, 2018 letter. Please reconcile for us the significant increase in the IPO scenario price per share as of March 31, 2018 as per your June 11, 2018 response to the estimated IPO mid-point price before effecting the reverse stock split.*

RESPONSE: The Company advises the Staff that, as disclosed in the Registration Statement, the fair value of the Company's common stock as of the March 16, 2018 option grants was retrospectively adjusted as a result of a contemporaneous valuation performed as of March 31, 2018. The fair value of the common stock as of March 31, 2018 was determined utilizing a probability weighted expected return method that utilized two scenarios, an initial public offering (IPO) scenario and a remain private scenario, which resulted in a total fair value per share of $1.46. The fair value in the IPO scenario was determined to be $1.93, which was based on a future projected IPO price per share of $2.45, which was adjusted for a discount for lack of marketability and to record the amount at present value. The mid-point of the range for the IPO was estimated to be $4.11 per share as of June 11, 2018. The difference between the future projected IPO price per share of $2.45 and the mid-point of the estimate range of $4.11 of $1.66 per share, or 68%, was primarily due to changes in the market between March 31, 2018 and June 11, 2018, evidence of greater acceptance of offerings by biotechnology companies focused on gene therapy, and advancements in the Company's clinical development. Specifically, in addition to the factors set forth in the Company's letter to the Staff dated June 1, 2018, the Company notes the following factors that contributed to the overall increase in value between March 31, 2018 and June 11, 2018:

- As noted above, the March 31, 2018 valuation was adjusted for a discount for lack of marketability and to record the amount at present value. This contributed to approximately 27% of the increase ($1.93 per share compared to $2.45 per share).
- From April 2, 2018 to June 11, 2018, the stock price for the guideline companies increased by a median percentage of 14% and an average of 24% Certain guideline companies significantly exceeded the 68% increase from the projected IPO price as of March 31, 2018 to the mid-point of the estimated range, including Solid Biosciences which increased by 111.1% and Sangamo Therapeutics which increased by 72.2%. As a result, the increase was within the range determined through review of the guideline companies.
- On April 9, 2018, the stock price for AveXis, Inc., a gene-therapy company, increased by 78% after an acquisition was announced by Novartis for $8.7 billion, representing an 88% premium to the market capitalization of AveXis on the date the acquisition was announced.
- Evidence of significant demand for biotechnology IPOs with eleven IPOs completed since March 31, 2018. These IPOs include MorphoSys AG (4/19/18), Surface Oncology (4/19/18), Inspire Medical Systems (5/3/18), Unity Biotechnology (5/3/18), ASLAN Pharmaceuticals (5/4/18), Evelo Biosciences (5/9/18), Kiniksa

Pharmaceuticals (5/24/18), Scholar Rock Holdings (5/24/18), Iterum Therapeutics (5/25/18), Hancock Jaffe Laboratories (5/31/18), and MeiraGTx Holdings (6/8/18).

- Recent IPO on June 8, 2018 of MeiraGTx Holdings, a gene therapy company, which completed an IPO that indicated an enterprise value of $313.2 million, which approximates the enterprise value implied by the mid-point of the estimated range used by the Company.
- Strong aftermarket performance of 2018 recent gene therapy IPOs of Homology Medicines, Inc. and Solid Biosciences, which were up 27% and 53% respectively since their effective IPO price to June 11, 2018.
- The Company dosed the first patient in its Phase 2 clinical trial for Fabry disease on June 7, 2018 and therefore entered into late stage clinical development. This patient is only the third patient dosed in clinical trials for AVR-RD-01, and this Phase 2 trial is the first Company-sponsored clinical trial for any of the Company's pipeline products. In connection with entering into Phase 2 development, the Company achieved significant operational milestones, including building international infrastructure, obtaining site approvals and regulatory clearances to initiate its Phase 2 clinical trial, which were capabilities that the Company previously utilized its academic partner, University Health Network, to achieve.

Based on the factors noted above, including increases in the market from March 31, 2018 to June 11, 2018 for the guideline companies, recent evidence of market acceptance for offerings related to entities focused on gene therapy, and advancements in the Company's clinical development, the Company believes the difference in value reflected between the estimated price range and the determination of the fair value of its common stock as of March 31, 2018 was appropriate. However, in response to the Staffs comment, the Company performed a sensitivity analysis to determine whether there would be a material change to the March 31, 2018 valuation based on hindsight assuming the Company knew the estimated IPO price of $4.11 per share at the time the March 31 2018 valuation was completed. Specifically, if the mid-point of the range was utilized as the estimated future IPO price per share, after applying the discount for lack of marketability, adjusting for present value, and applying the weighted-average derived value with the remain private scenario, the fair value of the common stock would be $2.12 per share. The difference in this amount compared to the previously determined fair value of $1.46 per share of $0.66 per share, or 45%, would result in a difference in the stock-based compensation expense recorded in the three month period ended March 31, 2018 of $17.7 thousand, if this value was applied to the March 16, 2018 option grants. This amount is considered to not be material to the interim financial statements or to the other information included in the Registration Statement.

If you have any questions or comments regarding the foregoing, or if there is any additional information that we might provide to assist the Staff's review, please contact the undersigned at (617) 570-1483.

Respectfully submitted,

/s/ James Xu
James Xu, Esq.

GOODWIN PROCTER LLP

cc: Geoff MacKay, *AVROBIO, Inc.*
Katina Dorton, *AVROBIO, Inc.*
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