



DIVISION OF  
CORPORATION FINANCE

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

December 3, 2020

Robert Ang, M.B.B.S.  
President and Chief Executive Officer  
Vor Biopharma Inc.  
100 Cambridgepark Drive  
Suite 400  
Cambridge, MA 02140

**Re: Vor Biopharma Inc.**  
**Draft Registration Statement on Form S-1**  
**Submitted November 6, 2020**  
**CIK No. 0001817229**

Dear Dr. Ang:

We have reviewed your draft registration statement and have the following 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 providing the requested information and either submitting an amended draft registration statement or publicly filing your registration statement on EDGAR. If 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 the information you provide in response to these comments and your amended draft registration statement or filed registration statement, we may have additional comments.

Draft Registration Statement on Form S-1, Submitted November 6, 2020

Summary, page 1

1. With reference to your disclosure on page 23, please revise the Overview to explain that your VOR33 candidate is pre-clinical and there have been no clinical trials of any engineered HSCs (eHSCs) to date.
2. Please tell us why VOR33 for MDS and MPN should be highlighted in the table given that you have not selected a development candidate and you provide limited disclosure in the Business section concerning this program.
3. With reference to your disclosure on page 21, please revise the disclosure on page 3 to

clarify that the Center for International Blood and Marrow Transplant Research also oversees the VCAR33 trial.

4. On page 3, please revise to state when you plan to submit an IND for VOR33 for AML, as you state on pages 20-21, and clearly explain that the Phase 1 clinical trial will evaluate VOR33 in combination with Mylotarg as you state on page 26. Please also further describe the mechanism of action for VCAR33, including the meaning of “bridge-to-transplant monotherapy” and how the therapy uses autologous T cells from the patient. Please clarify in the Summary the extent to which you view VCAR33 as a distinct and standalone treatment option.
5. Please revise the Summary to make clear, as you do on pages 26 and 100, that you expect VOR33 and any other eHSC product candidates will be required to be used in combination with another therapy.
6. Please revise your disclosure on page 3 to explain that Mylotarg is a commercialized therapy owned by a third-party. Given that your one clinical stage program incorporates this third-party therapy, also revise the Summary to put your "single company solution" statement into context.
7. Please revise the Summary to briefly explain what a CAR-T therapy is so it is clear how it differs from stem cell transplants.

Risk Factors, page 13

8. On page 58 you state that you rely on CRISPR-Cas9 genome engineering technology to create VOR33 and will need a license to this technology prior to commercialization. Please revise to discuss, as applicable, the general timeline for obtaining licenses to genome engineering technology. For instance, explain whether this process typically commences during early or late clinical development or after regulatory approval has been received. Also, revise to discuss whether the licenses granted are typically exclusive or non-exclusive in nature. Discuss, if known, whether there are existing licenses covering the field of use(s) that you are targeting and that could prevent or negatively impact commercialization.

Management's Discussion and Analysis of Financial Condition and Results of Operations  
Critical Accounting Policies and Significant Judgments and Estimates  
Stock-Based Compensation, page 114

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 IPO and the estimated offering price. This information will help facilitate our review of your accounting for equity issuances including stock compensation and beneficial conversion features. Please discuss with the staff how to submit your response.

Business, page 119

10. Please revise page 119 to further describe your arrangement with the Center for International Blood and Marrow Transplant Research, including any contractual or monetary commitments. If required by Item 601(b)(10) of Regulation S-K, please also file any agreement with the Center for International Blood and Marrow Transplant Research or advise.
11. On page 125 and elsewhere you state: “Our approach also does not involve the insertion of new genetic material, thereby avoiding complications related to the use of delivery modalities necessary for gene insertion, such as viral vectors.” Please revise the statement on page 125 and elsewhere as appropriate to disclose that your companion therapeutic VCAR33 to be used in conjunction with VOR33 employs viral vectors, as you state on page 24.
12. We note the following statement on page 126 and the corresponding graphic on page 127: “In addition, as shown in the right graphic below, we observed in other preclinical studies that our process resulted in 88% of eHSCs having removal of CD33 on both copies, or alleles, of the gene, effectively eliminating any expression of CD33.” Please include further details for this studies, such as the number of subjects.
13. On page 132, we note that in in vitro studies you “observed few differences in cell killing at extreme Mylotarg concentrations.” Please revise to state the dosage range that Mylotarg is approved for and the dose typically administered.
14. Please provide the number of subjects for your mice studies on pages 133-135.
15. Please revise the disclosure to describe the bottom left panel of the figure at the top of page 134.
16. On page 135 you state: “...we observed statistically significant lower rates of CD33 surface proteins...” Please provide the corresponding p-values and describe how they relate to the FDA’s standards of efficacy. Please also revise to ensure each vertical axis in the graphic on page 135 is explained.
17. We note when describing the royalty term for the Columbia Agreement described on page 149 and the Patent License described on page 50, you state that the term will expire on the latest to occur of several events, including the expiration date of the last valid claim on a country-by-country basis. Please revise to clarify when these claims are due to expire.
18. Please revise pages 153-154 to provide the specific jurisdictions to which your owned and licensed patents and patent applications relate.
19. Your disclosure on page 137 states that you expect that engraftment of VOR33 will occur within 28 days of administration. Please tell us how this timeframe compares to engraftment for existing HSCT therapies.

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20. Please revise page 141 to state the number of subjects covered by each of the two phases of the VCAR33 Phase 1/2 clinical trial.

General

21. Please supplementally provide us with 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, present to potential investors in reliance on Section 5(d) of the Securities Act, whether or not they retain copies of the communications.

You may contact Eric Atallah at (202) 551-3663 or Kevin Kuhar at (202) 551-3662 if you have questions regarding comments on the financial statements and related matters. Please contact Margaret Schwartz at (202) 551-7153 or Joe McCann at (202) 551-6262 with any other questions.

Sincerely,

Division of Corporation Finance  
Office of Life Sciences