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LATHAM & WATKINS LLP

April 5, 2018

File No. 055191-0006

VIA EDGAR AND HAND DELIVERY

United States Securities and Exchange Commission
Division of Corporation Finance
Office of Healthcare & Insurance
100 F Street, N.E.
Washington, D.C. 20549-6010

Attention: Suzanne Hayes, Assistant Director
James Rosenberg, Senior Assistant Chief Accountant
Jeffrey Gabor, Staff Attorney
Ada Sarmento, Staff Attorney
Lisa Vanjoske, Assistant Chief Accountant
Vanessa Robertson, Senior Staff Accountant

Re: **Unity Biotechnology, Inc.**
Draft Registration Statement on Form S-1
Confidentially submitted on March 1, 2018
CIK No. 0001463361

Ladies and Gentlemen:

On behalf of Unity Biotechnology, Inc. (the "***Company***" or "***Unity***"), we are hereby filing a Registration Statement on Form S-1 ("***Registration Statement***"). The Company previously submitted a Draft Registration Statement on Form S-1 on March 1, 2018 (the "***Draft Submission***") to the U.S. Securities and Exchange Commission (the "***Commission***") on a confidential basis pursuant to Title I, Section 106 under the Jumpstart Our Business Startups Act. The Registration Statement has been revised to reflect the Company's responses to the comment letter to the Draft Submission received on March 28, 2018 from the staff of the Commission (the "***Staff***"). For your convenience, we are providing by overnight delivery a courtesy package that includes ten copies of the Registration Statement, five of which have been marked to show changes from the Draft Submission, as well as a copy of this letter.

For ease of review, we have set forth below each of the numbered comments of your letter in bold type followed by the Company's responses thereto.

Draft Registration Statement on Form S-1

Prospectus Summary, page 1

1. We note your disclosure that preclinical studies published in Nature and Science have demonstrated the selective elimination of senescent cells extends both the healthspan and lifespan of animals. Please provide the full names of these publications and the dates that such preclinical studies appeared in each publication.

Response: In response to the Staff's comment, the Company has revised pages 1 and 86 of the Registration Statement.

Advantages of Our Approach, page 3

2. Please provide the basis for your statements that you have secured a "lead position" in the discovery and development of senolytic medicines and that you "continue to be at the forefront of extending human lifespan."

Response: The Company respectfully acknowledges the Staff's comment and advises the Staff that the Company's statements with regard to its "lead position" in the discovery and development of senolytic medicines are supported by the following:

(i) the Company submitted an investigational new drug ("***IND***") for UBX0101, a senolytic medicine, in March 2018, and the Company is not aware of any other submissions of IND applications for senolytic medicines in the United States.

(ii) the Company believes its patent portfolio covering its cellular senescence program, which includes five issued U.S. patents, over 30 pending U.S. applications (including 14 provisional), and over 30 granted or pending patent applications in foreign jurisdictions, contains the greatest number of issued patents and pending patents relating to the use of pharmaceutical agents for removing senescent cells in the treatment of human diseases among companies in the United States, and that its issued patents have the earliest priority date among issued patents related to the use of pharmaceutical agents for removing senescent cells in the treatment of human diseases in the United States. The Company's cellular senescence patent portfolio contains patents and patent applications directed at compositions of matter, methods of use for treating age-related conditions and methods of manufacture.

(iii) to date, the Company's scientific founders and employees have published more than 100 peer reviewed papers on cellular senescence, the role senescence plays in diseases associated with aging and the development of senolytic medicines.

(iv) to date, the Company's scientific founders and employees have received several awards for their discoveries relating to cellular senescence, including *Science* listing the findings of the Company's scientific co-founders relating to cellular senescence among the top breakthroughs of 2011 and 2016.

In addition to the foregoing in respect of the Company's leadership position with respect to senolytic medicines, its ongoing research and discovery activities relating to other mechanisms of aging, including loss of circulating youth factors and mitochondrial dysfunction, and its early-stage research and discovery focused collaborations with more than a dozen academic institutions, together with the significant capital raised from leading healthcare investors, establish it at the forefront of extending human healthspan.

Our Pipeline, page 3

3. Please revise the pipeline table on pages 3 and 86 to include columns for Phase 2 and Phase 3. Also, please remove references to product candidates in the discovery or research stage of development from the table. Research and discovery activities that precede the identification of a product candidate are too remote to be highlighted in the pipeline table. Please limit your table to products that are at least in the preclinical stage of development.

Response: In response to the Staff's comment, the Company has revised pages 3 and 87 of the Registration Statement.

Our Team, page 4

4. We note your disclosure here, in the risk factors and in the Business section that you maintain more than a dozen active collaborations with leading external academic institutions, including: the Buck Institute for Research on Aging; Massachusetts General Hospital; Mayo Clinic; the Medical Research Council (MRC, Imperial College); The University of California, San Francisco; and Yale University. Please briefly disclose the nature of such collaborations in the Business section. If any of these collaborations are evidenced by agreements, please tell us how you determined that you were not required to file such agreements as exhibits.

Response: In response to the Staff's comment, the Company has revised pages 4, 33 and 88 of the Registration Statement to clarify that these relationships are "early-stage research and discovery focused collaborations". The Company respectfully advises the Staff that none of these collaborations are currently material to the Company's business because the current and ongoing financial commitments underlying the agreements are immaterial. In addition, the Company believes that the probability of the successful achievement of any milestones that could trigger material commitments or obligations of the Company under certain of these agreements is sufficiently low such that the agreements should not be considered material at this time. Additionally, many of the agreements are similar to sponsored research agreements whereby the Company funds particular research and development activities related to early and discovery stage programs under investigation for potential future development.

Risk Factors, page 12

5. Please revise your disclosure to explain what you mean by the term "clinically meaningful."

Response: In response to the Staff's comment, the Company has revised page 18 of the Registration Statement.

Use of Proceeds, page 63

6. Please specify how far in the clinical development of each of your product candidates you expect to reach with the proceeds of the offering. If any material amounts of other funds are necessary to accomplish the specified purposes for which the proceeds are to be obtained, state the amounts and sources of such other funds needed for each such specified purpose and the sources thereof. Refer to Instruction 3 to Item 504 of Regulation S-K.

Response: In response to the Staff's comment, the Company has revised page 63 of the Registration Statement.

Management's Discussion and Analysis of Financial Condition and Results of Operations
Critical Accounting Policies and Estimates
Stock-Based Compensation, page 80

7. 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.

Response: The Company respectfully acknowledges the Staff's comment and undertakes that, once an estimated offering price is available, it will provide the Staff with a supplemental letter containing the fair value underlying its equity issuances and an analysis explaining the reasons for any differences between the Company's recent fair value determinations and the estimated offering price, if any.

JOBS Act Accounting Election, page 83

8. You disclose that you have elected to use the transition period for complying with new or revised accounting standards. Therefore please remove the check mark on the cover page that states you have elected not to use the extended transition period.

Response: The Company respectfully acknowledges the Staff's comment and has revised the cover page of the Registration Statement to indicate that the Company will elect to use the extended transition period for complying with new or revised accounting standards.

Business, page 85

9. Please define DMSO in Figure 6 on page 101 and PBS in Figures 15A and 15B on page 114.

Response: In response to the Staff's comment, the Company has revised pages 102 and 116 of the Registration Statement.

Preclinical Studies with UBX0101, page 99

10. We note your disclosure that you have "completed IND-enabling studies of UBX0101, including GLP safety assessment studies, with single administration of intra-articular and oral dosing." For each pre-clinical trial, please disclose the date(s) of the trials, the sponsor and the location, scope and size, dosage and duration, and actual results observed.

Response: In response to the Staff's comment, the Company has revised pages 102 and 103 of the Registration Statement.

Intellectual Property, page 117

11. For each of your material patents, please disclose (1) the specific product(s) to which such patents or patent applications relate; (2) whether the patents are owned or licensed from third parties, and if so, from whom; (3) the type of patent protection (composition of matter, use or process); (4) patent expiration dates and expected expiration dates for patent applications; and (5) the jurisdictions where such patents were issued and such patent applications are pending.

Response: In response to the Staff's comment, the Company has revised pages 120 and 121 of the Registration Statement.

Principal Stockholders, page 163

12. Please revise your disclosure to identify the natural person or persons who have voting and investment control of the shares held by WuXi PharmaTech Healthcare Fund I LP, Venrock Partners, the Mayo Clinic and Baillie Gifford & Co.

Response: In response to the Staff's comment, the Company has revised pages 170 through 171 of the Registration Statement.

In the case of Venrock Associates and Venrock Partners, the investment and voting decisions are made jointly by three or more individuals associated with their sole general partner, Venrock Management. Under the "rule of three," if voting or investment decisions with respect to issuer securities require a vote of a majority of three or more persons, none of them will be deemed the beneficial owner of those securities for purposes of Section 13(d) of the Securities Exchange Act of 1934, as amended. See Southland Corp. (July 8, 1987). Based upon this analysis, no individual managing director of Venrock Management exercises investment and voting control over the securities of Venrock Associates and Venrock Partners, except with respect to the shares in which he or she directly holds a pecuniary interest.

In the case of Baillie Gifford & Co., the investment and voting decisions of SMIT and EWIT are made jointly by three or more individuals of their agent Baillie Gifford & Co. Based upon the same Southland Corp. analysis, no individual managing director of Baillie Gifford & Co. exercises investment and voting control over the securities of SMIT and EWIT, except with respect to the shares in which he or she directly holds a pecuniary interest.

General

13. 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.

Response: The Company respectfully acknowledges the Staff's comment and undertakes that it will provide the Staff with any written materials that it or anyone authorized to do so on its behalf presents to potential investors that are qualified institutional buyers or institutional accredited investors in reliance on Section 5(d) of the Securities Act.

14. Please provide us proofs of all graphics, visual, or photographic information you will provide in the printed prospectus prior to its use, for example in a preliminary prospectus. Please note that we may have comments regarding this material.

Response: The Company respectfully acknowledges the Staff's comment and confirms that the Registration Statement contains all of the graphics the Company currently intends to use in the prospectus.

* * *

LATHAM & WATKINS LLP

We hope the foregoing answers are responsive to your comments. Please do not hesitate to contact me by telephone at (650) 463-3014 or by fax at (650) 463-2600 with any questions or comments regarding this correspondence.

Very truly yours,

/s/ Brian J. Cuneo

Brian J. Cuneo
of LATHAM & WATKINS LLP

cc: Keith R. Leonard Jr., Unity Biotechnology, Inc.
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