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LATHAM & WATKINS LLP

June 6, 2016

VIA EDGAR AND HAND DELIVERY

Ms. Suzanne Hayes
Assistant Director
Office of Healthcare and Insurance
United States Securities and Exchange Commission
100 F Street, N.E.
Mail Stop 4720
Washington, D.C. 20549

Re: **Selecta Biosciences, Inc.**
Registration Statement on Form S-1
Filed May 24, 2016
File No. 333-211555

Dear Ms. Hayes:

On behalf of Selecta Biosciences, Inc., a Delaware corporation (the "***Company***"), we are transmitting this letter in response to comments received from the staff (the "***Staff***") of the Securities and Exchange Commission by letter dated June 3, 2016 with respect to the Company's Registration Statement on Form S-1 filed on May 24, 2016 (the "***Registration Statement***"). The bold and numbered paragraphs below correspond to the numbered paragraphs in the Staff's letter and are followed by the Company's responses. Unless otherwise indicated, capitalized terms used herein have the meanings assigned to them in the Registration Statement.

"Clinical drug development involves a lengthy and expensive process…" page 21

1. **Please revise this risk factor to describe the serious adverse events observed in your Phase 1b clinical trial discussed on page 131.**

Response: The Company acknowledges the Staff's comment and advises the Staff that the Company proposes to revise the second paragraph of the referenced disclosure in "Risk factors—Risks related to the discovery, development and regulatory approval of our product candidates—Clinical drug development involves a lengthy and expensive process…" for inclusion in the next pre-effective amendment to the Registration Statement. The revised disclosure would read as follows (revisions marked in bold and underlined or strike-through text):

"**SEL-212 is currently being evaluated in a Phase 1/2 clinical program that includes a Phase 1a and Phase 1b clinical trial. As of June 3, 2016, on a combined basis, we had dosed a total of 70 subjects with either SEL-212 (SVP-Rapamycin and pegsiticase), SVP-Rapamycin alone or pegsiticase alone in the Phase 1a and Phase 1b clinical trials. We expect to receive final data from both Phase 1 clinical trials in the second half of 2016. Based on preliminary results from the Phase 1 clinical trials, we have generally observed that SEL-212 and its components, SVP-Rapamycin and pegsiticase, have been well tolerated.** ~~As of November 2015, we have completed the patient treatment portion of our Phase 1a trial for pegsiticase. The Phase 1a trial was a study of one of the components of SEL-212, pegsiticase, in an ascending single dose cohort study of 22 subjects. In this trial, pegsiticase demonstrated no serious adverse effects and was well tolerated at the five dose levels tested.~~ There can be no assurance, however, that these preliminary results will be predictive of the final results of the trial. Moreover, the biological effect observed in this trial has been observed only in the subjects of the trial, and is not statistically significant and might not be observed in any other patients treated with ~~pegsiticase or~~ SEL-212 **or its components, SVP-Rapamycin and pegsiticase**. **As of June 3, 2016, there have been two serious adverse events, or SAEs, in the Phase 1 clinical trials. One SAE occurred in a 62 year-old male who received a dose level of pegsiticase alone of 0.4 mg/kg. This subject developed atrial fibrillation 13 days after administration of pegsiticase. The subject was treated and the medical records from the principal investigator indicate that this subject has recovered. The principal investigator has deemed this SAE to not have been related to the study drug, pegsiticase. The second SAE occurred in a 59 year-old male who developed a pruritic rash on his lower extremities and joint pain approximately 12 days after being dosed with SEL-212, consisting of a dose level of SVP-Rapamycin of 0.1 mg/kg and a dose level of pegsiticase of 0.4 mg/kg. This subject was treated with steroids, analgesics, anti-nausea medications and topical antihistamine cream. Following treatment, the medical records from the principal investigator indicate that the rash and joint pain**

experienced by the subject have been resolved. The principal investigator classified this second SAE as having been possibly related to the study drug, SEL-212. We can provide no assurance that additional SAEs or

similar events will not arise in the course of our development of SEL-212 or other product candidates."

Business, page 105

2. **We note your statement that your first gene therapy program is targeted to treat a rare genetic disease and that you are developing a second gene therapy for a genetic metabolic disorder. Please expand your description of these programs to identify the indications.**

Response: The Company acknowledges the Staff's comment and advises the Staff that the Company proposes to revise the referenced disclosure on page 105 for inclusion in the next pre-effective amendment to the Registration Statement. The revised disclosure would read as follows (revisions marked in bold and underlined or strike-through text):

"We have in-licensed Anc80 from the Massachusetts Eye and Ear Infirmary and The Schepens Eye Research Institute, Inc., collectively referred to as MEE. In preclinical studies, Anc80 has been observed to be a potent gene therapy vector that has demonstrated the capability of yielding superior gene expression levels in the liver compared to naturally occurring AAVs that are currently evaluated in clinical trials. As a synthetic vector, we believe Anc80 has limited cross-reactivity to naturally-occurring AAVs and therefore has the potential to treat patients with pre-existing AAV-specific ADAs. By combining SVP-Rapamycin and Anc80, we intend to develop highly differentiated gene therapies to address all three of the immunogenicity issues associated with the use of viral vectors. ~~Our first gene therapy program is targeted to treat a rare genetic disease pursuant to which we are collaborating with a~~**In collaboration with the** clinical and gene therapy laboratory at the National Institutes of Health and MEE**, we plan to develop a product candidate utilizing the Anc80 vector for the treatment of an autosomal recessive metabolic, or ARM, disorder resulting from an inborn error of metabolism. Patients with this ARM disorder frequently suffer from severe developmental defects and premature death as a result of an accumulation of toxic metabolites**. Under our license agreement with MEE, we also have the option to develop gene therapies using Anc80 for several additional diseases including lysosomal storage, muscular and genetic metabolic diseases. ~~For our second gene therapy program, we are using another gene therapy vector and collaborating~~**We plan to develop another product candidate for the treatment of an X-linked metabolic, or XLM, disorder, which is a metabolic disorder similar to ARM disorder. We are pursuing this second indication through collaborations** with third parties with preclinical and clinical experience **in this area**~~to develop a new gene therapy for a genetic metabolic disorder~~."

Notes to Consolidated Financial Statements

12. Revenue arrangements
Sanofi collaboration agreement, page F-36

3. **Please disclose each milestone and its amount included within the further development milestones which may aggregate up to $127.0 million. Refer to ASC 605-28-50-2.**

Response: The Company acknowledges the Staff's comment and advises the Staff that the Company proposes to revise the sixth paragraph of the referenced disclosure in "Notes to consolidated financial statements—12. Revenue arrangements—Sanofi collaboration agreement" for inclusion in the next pre-effective amendment to the Registration Statement. The revised disclosure would read as follows (revisions marked in bold and underlined or strike-through text):

"Under the terms of the research collaboration portion of the Sanofi Agreement, the Company is required to use commercially reasonable efforts to perform the activities set out for the Company in the research and development plans created and overseen by a joint research committee. The Company is responsible for manufacturing all vaccines required for research, development and commercialization of licensed products. Pursuant to the Sanofi Agreement, Sanofi has paid the Company an initial payment of $2.0 million for the initial indication and an additional $2.0 million for the second indication of celiac disease. Sanofi is obligated to make additional payments to the Company during preclinical research totaling up to $3.0 million for each indication, which has been received for the food allergy indication. For each indication, the Company is also eligible for (i) a $5.0 million development candidate milestone payable to the Company at the start of preclinical development, (ii) further development milestones up to an aggregate of $127.0 million**, which includes up to an aggregate of $57.0 million following the initiation of Phase I, Phase II and Phase III clinical trials for the indication and filing of the first biologic license application and an aggregate of $70.0 million upon achieving various regulatory approvals in the United States, European Union, Japan and Brazil, Russia, India or China,** (iii) sales milestones of up to an aggregate of $170.0 million, and (iv) tiered royalties on annual net sales of licensed products at percentages ranging from mid-single to low double digits."

Management's Discussion and Analysis of Financial Condition and Results of Operations
Critical Accounting Policies and Use of Estimates
Stock Based Compensation, page 96

4. **Please refer to your May 31, 2016 letter regarding the estimated public offering price per share for your proposed initial public offering and the accounting treatment for share- based compensation. Please reconcile for us the difference between the fair value as of the most recent valuation date and the mid-point of your estimated IPO price range. Include an explanation for each significant factor contributing to the difference.**

Response: The Company acknowledges the Staff's comment and advises the Staff that, pursuant to conversations between its counsel and the Staff on June 3, 2016, the Company is responding to the Staff's comment under separately filed correspondence.

We hope that the foregoing has been responsive to the Staff's comments and look forward to resolving any outstanding issues as quickly as possible. Please do not hesitate to contact me at 202-637-2117 or Peter Handrinos at 617-948-6060 with any questions or further comments you may have regarding this filing or if you wish to discuss the above.

Sincerely,

/s/ Brandon J. Bortner

Brandon J. Bortner
of LATHAM & WATKINS LLP

cc: (via e-mail)

Michael Gershon, Securities and Exchange Commission
Werner Cautreels, Ph.D., President and Chief Executive Officer, Selecta Biosciences, Inc.
David Abraham, Chief Compliance Officer and General Counsel, Selecta Biosciences, Inc.
Peter N. Handrinos, Latham & Watkins LLP