Issuer Free Writing Prospectus dated June 20, 2016
Filed Pursuant to Rule 433
Relating to the Preliminary Prospectus dated June 8, 2016 and
Registration Statement No. 333-211555

Update to Preliminary Prospectus
Issued June 8, 2016

This free writing prospectus relates only to the initial public offering of shares of common stock of Selecta Biosciences, Inc. (the "Company") and should be read together with the preliminary prospectus (the "Preliminary Prospectus"), subject to completion, dated June 8, 2016, included in Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-211555), relating to the Company's initial public offering.

On June 20, 2016, the Company filed Amendment No. 2 to the Registration Statement on Form S-1 ("Amendment No. 2"), which may be accessed through the following link: http://www.sec.gov/Archives/edgar/data/1453687/000104746916013886/a2228960zs-1a.htm.

The information set forth below from Amendment No. 2 reflects updates to disclosures for a serious adverse event recently reported to the Company, the approval of the Company's common stock for listing on The NASDAQ Global Market and updates to disclosures relating to the Company's equity incentive plans.

Update to "Risk factors" and Phase 1b clinical trial disclosure

After the date of the Preliminary Prospectus, a serious adverse event in the Phase 1b clinical trial of SEL-212 was observed. This serious adverse event was in addition to the two serious adverse events previously disclosed in the Preliminary Prospectus.

Accordingly, the disclosures set forth on page 21 of the Preliminary Prospectus in the second paragraph under the section entitled "Risk factors—Risk related to the discovery, development and regulatory approval of our product candidates—Clinical drug development involves a lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates" and on page 133 of the Preliminary Prospectus under the last paragraph of the section entitled "Business—Our SVP programs to induce antigen-specific tolerance—SEL-212 for the treatment of refractory and chronic tophaceous gout—Clinical development—Phase 1b clinical trial" have been updated to include the following:

> As of June 16, 2016, there have been three serious adverse events, or SAEs, in the Phase 1 clinical trials.
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> A third observation was classified by the principal investigator on June 15, 2016 as an SAE after a 59 year-old male from Cohort #7 (SVP-Rapamycin Cohort) of the Phase 1b clinical trial developed stomatitis approximately seven days after being dosed with 0.5 mg/kg of SVP-Rapamycin, the highest dose of SVP-Rapamycin in the SVP-Rapamycin Cohorts of the Phase 1b clinical trial, and experienced 4.3 kg of weight loss. Stomatitis is a form of mouth sores and inflammation of the mouth and lips that often limits food intake and, according to the label for rapamycin, is a common adverse reaction to rapamycin itself. This subject was treated with oral over-the-counter and topical antihistamines followed by a steroid gel. As of June 16, 2016, the principal investigator indicated that the subject's stomatitis was improving. The principal investigator classified this third SAE as having been possibly related to the study drug, SVP-Rapamycin.

NASDAQ Global Market

> The Company's common stock has been approved for listing on The NASDAQ Global Market under the symbol "SELB."

Equity award plans

The disclosure in the Preliminary Prospectus has been updated as follows:

- 819,460 shares are available for future issuance under the 2016 Incentive Award Plan (pages 10, 72 and 76);
- the option to purchase up to 123,076 shares granted to Dr. Cautreels on December 4, 2015 vests in 48 equal monthly installments (pages 186 and 187);
- 2,213,412 shares are reserved for future issuance under the 2008 Equity Incentive Plan (page 194); and
- 1,723,704 options are outstanding and 1,046,380 options are vested as of May 31, 2016 (pages 206 and 211).

The Company has filed a registration statement (including the Preliminary Prospectus) with the Securities and Exchange Commission (the "SEC") for the offering to which this communication relates. Before you invest, you should read the Preliminary Prospectus in that registration statement for more complete information about the Company and this offering. You may get these documents for free by visiting EDGAR on the SEC website at *www.sec.gov*. Alternatively, a copy of the Preliminary Prospectus may be obtained from the offices of: UBS Securities LLC, Attention: Prospectus Department, 299 Park Avenue, New York, NY 10171, (888) 827-7275; or Stifel, Nicolaus & Company, Incorporated, Attention: Syndicate, One Montgomery Street, Suite 3700, San Francisco, CA 94104, or by telephone at (415) 364-2720 or by email to *syndprospectus@stifel.com*. You may obtain a copy of Amendment No. 2 at http://www.sec.gov/Archives/edgar/data/1453687/000104746916013886/a2228960zs-1a.htm**.**