Corporate Presentation

April 2020

Nasdaq | SELB

Safe harbor/disclaimer

Any statements in this presentation about the future expectations, plans and prospects of Selecta Biosciences, Inc. ("the company"), including without limitation, statements regarding the progress of the clinical development of SEL-212, the anticipated timing of the head-to-head trial comparing SEL-212 and Krystexxa® and related data readouts, whether the head-to-head trial with Krystexxa will demonstrate superiority, provide rapid results or de-risk the Phase 3 trials for SEL-212, the company's ability to enroll patients in its clinical trials, the potential of ImmTOR™ to reduce AAV vector immunogenicity and enable re-dosing of AAV gene therapy without neutralizing antibody formation or loss of therapy expression, the anticipated timing of preclinical toxicology studies in AAV gene therapy and initiation of a clinical trial related thereto, the potential of SEL-212 to serve unmet needs in chronic refractory gout patients including sustained sUA reduction, reduced flares, and once monthly dosing, the anticipated timing for advancing into Phase 3 if at all, the anticipated timing of the company's plans to meet with the U.S. Food and Drug Administration, the ability of the company's ImmTOR technology to induce immune tolerance and mitigate antigen-specific neutralizing antibody formation, the scalability of the company's manufacturing processes, the potential of ImmTOR to enable sustained therapeutic activity of biologic therapies, whether current evaluable SEL-212 patients will be predictive of future evaluable SEL-212 patients, whether maintained SUA level reduction correlates with low and/or negative drug- specific antibody titers, the potential of SEL-212 to significantly reduce tophi/heavy urate burden and/or rapidly eliminate tissue urate burden, whether SEL-212 has the ability to reduce gout flares frequency initially and over time during SEL-212 therapy, anticipated achievement of key milestones for the company's chronic refractory gout and gene therapy programs, the company's ability to execute on its strategic priorities, advance its ImmTOR platform, and grow its strategic partnerships, the potential of the company's partnership with Asklepios BioPharmaceutical, Inc. to address unmet medical need in patients with rare diseases, the amount of upfront and milestone payments that Selecta is eligible to receive pursuant to its license agreement with Asklepios BioPharmaceutical, Inc., the company's expected cash position and runway, the billion dollar market potential of the chronic refractory gout market, the ability of the company's ImmTOR platform to unlock the full potential of biologic therapies, the potential of SEL-212 to enable sustained efficacy in chronic refractory gout patients and resolve their symptoms, the potential treatment applications for products utilizing the ImmTOR platform in areas such as enzyme therapy and gene therapy, the potential of AAV gene therapy to transform the future in a variety of inherited and acquired diseases, the potential of the ImmTOR platform generally, and other statements containing the words "anticipate," "believe," "continue," "could," "estimate," "expect," "hypothesize," "intend," "may," "plan," "potential," "predict," "project," "should," "target," "would," and similar expressions, constitute forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including, but not limited to, the following: the uncertainties inherent in the initiation, completion and cost of clinical trials including their uncertain outcomes, the availability and timing of data from ongoing and future clinical trials and the results of such trials, whether preliminary results from a particular clinical trial will be predictive of the final results of that trial or whether results of early clinical trials will be indicative of the results of later clinical trials, the unproven approach of the company's ImmTOR technology, potential delays in enrollment of patients, undesirable side effects of the company's product candidates, its reliance on third parties to manufacture its product candidates and to conduct its clinical trials, the company's inability to maintain its existing or future collaborations, proprietary programs, licenses or contractual relationships, the ability of Asklepios BioPharmaceutical, Inc. to develop products and make milestone payments under the license agreement to treat pompe disease, the company's inability to protect its proprietary technology and intellectual property, potential delays in regulatory approvals, the availability of funding sufficient for its foreseeable and unforeseeable operating expenses and capital expenditure requirements, the possibility that the company's recurring losses from operations and negative cash flows from operations could raise substantial doubt regarding its ability to continue as a going concern, substantial fluctuation in the price of its common stock, the company's strategy may change, and the company may not be able to effectively implement its current strategic plan, the size of the company's workforce following the restructuring may not be sufficient, and the company may not be able to effectively attract or retain new employees, risks associated with the restructuring, such as employee claims and the risk that the actual financial and other impacts of the reduction could vary materially from the outcomes anticipated, the impact, if any, of the COVID-19 outbreak on the company's operations, including supply chain and clinical trials, other COVID-19 related risks and other important factors discussed in the "Risk Factors" section of the company's Annual Report on Form 10-K filed with the Securities and Exchange Commission, or SEC, on March 12, 2020, and in other filings that the company makes with the Securities and Exchange Commission. In addition, any forward-looking statements included in this presentation represent the company's views only as of the date of its publication and should not be relied upon as representing its views as of any subsequent date. The company specifically disclaims any obligation to update any forward-looking statements included in this presentation.

Selecta™ Biosciences

Selecta well-positioned for success

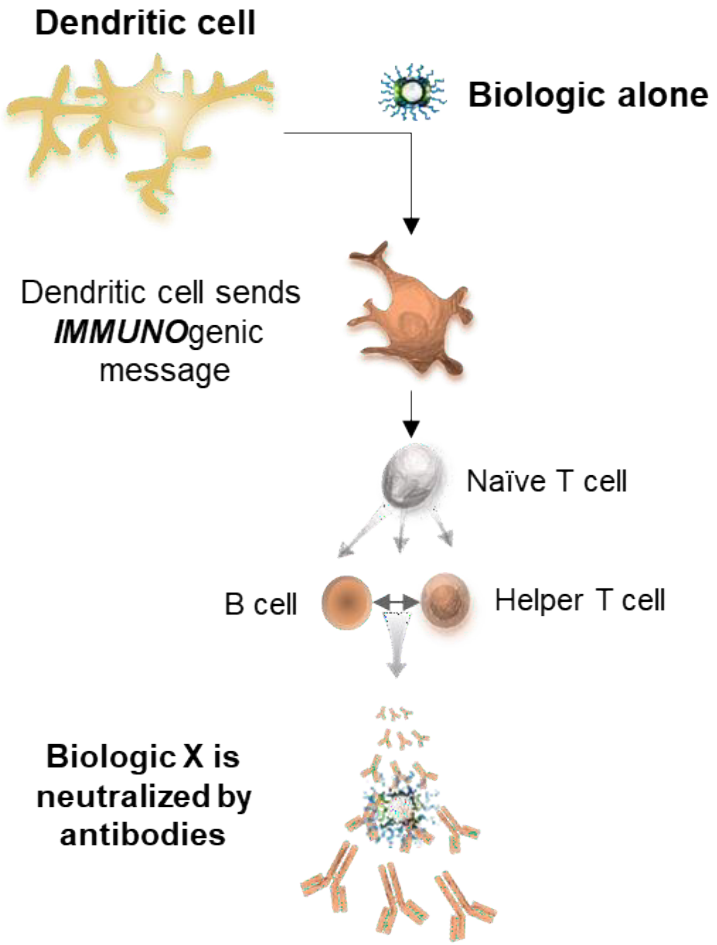
- ***Tolerogenic platform* – Selecta's immune tolerance platform, ImmTOR™, could unlock the full potential of biologic therapies by mitigating Neutralizing Antibody (Nab) formation**
  - Pipeline focused on therapeutic biologics/enzymes and AAV gene therapies
- ***Lead program* – SEL-212, addressing a $1B+ chronic refractory gout market with high unmet need**
  - COMPARE trial ongoing to evaluate efficacy and safety of SEL-212 vs. pegloticase, which is marketed as KRYSTEXXA®
    - Announced completion of enrollment in December 2019, with approximately 150 patients enrolled (approximately 75 patients per arm)
    - Top-line data to be reported in 3Q 2020
  - Phase 3 pivotal program against placebo to commence in 2H 2020
- ***Pipeline* – gene therapy program to enter the clinic in 2020**
  - Preclinical results suggest high relevance to diseases which may require re-dosing gene therapies to maintain efficacy
  - Several collaborations & licensing agreements with leading gene therapy players
    - 50/50 collaboration agreement with AskBio
    - License agreement with AskBio for Pompe disease
    - License agreement with Spark for Hemophilia A
- **Appointed Carrie S. Cox as Chairman of the Company's Board of Directors in November 2019**

Selecta™ Biosciences

ImmTOR

Immune
Tolerance
Platform

Biologic therapies may trigger NAbs that negate their therapeutic benefit



- There is a significant unmet need for a technology that selectively induces immune tolerance

- Dendritic cells play a key role in immune tolerance, providing a promising target to mitigate unwanted antigen-specific immune responses

Inducing selective immune tolerance for biologic therapies considered the "Holy Grail"

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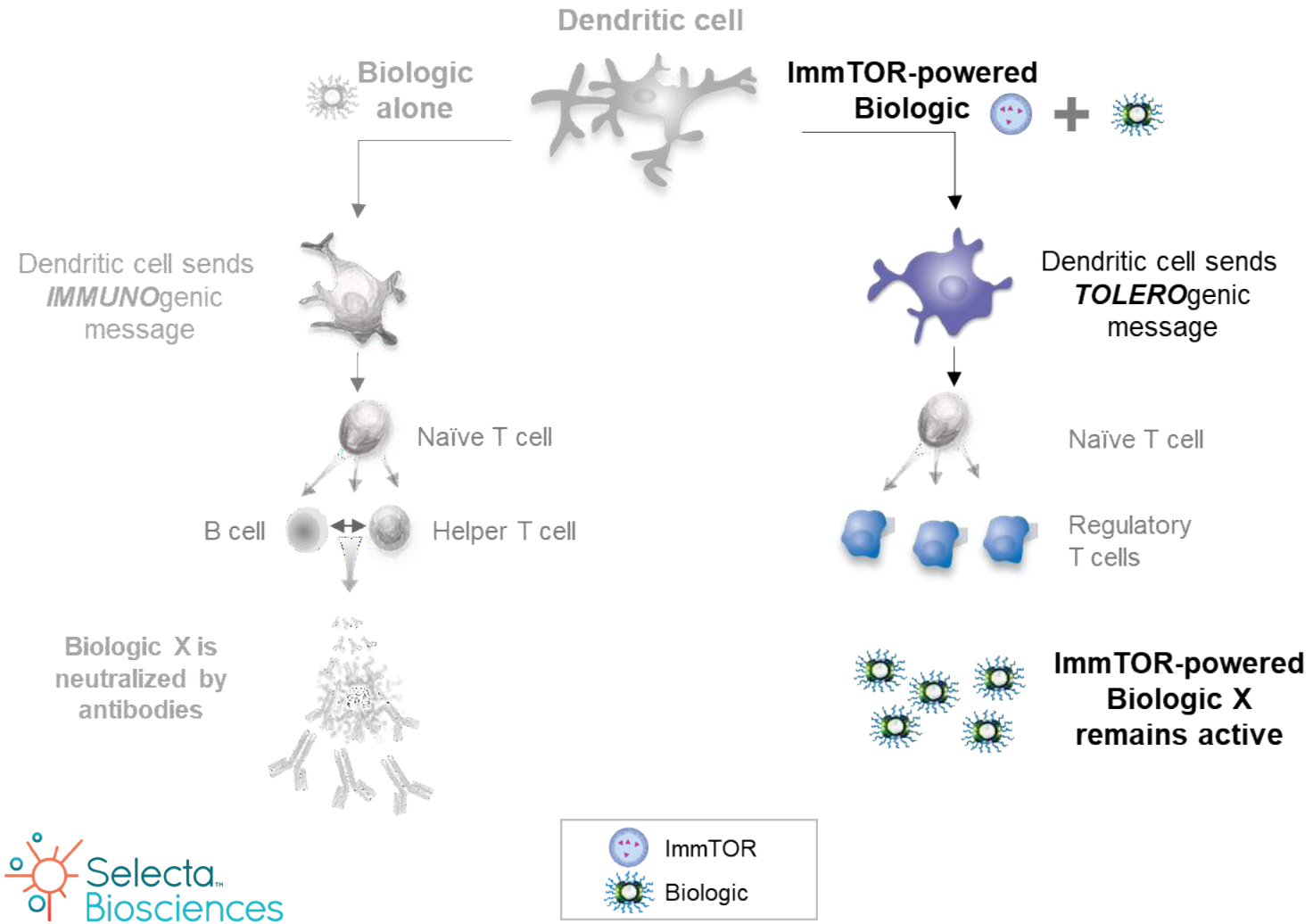
ImmTOR has the potential ability to enable sustained therapeutic activity of biologic therapies and unlock their potential



- Co-administer with biologic therapies to mitigate antigen-specific NAb formation

- Induce a ***tolerogenic*** message from the dendritic cell to naïve T cells to develop into T regulatory cells

Promote selective immune tolerance of the biologic therapy

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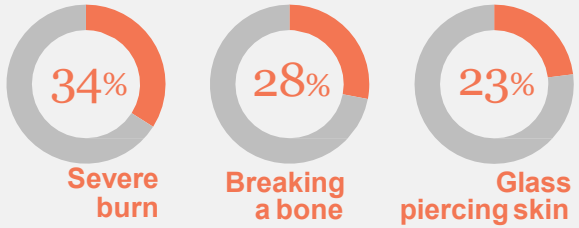
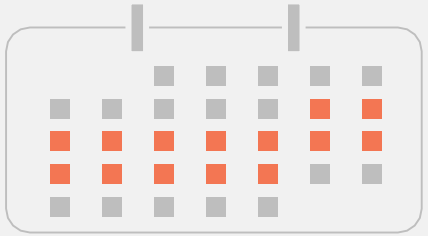
SEL-212
(ImmTOR+pegadricase)
for Chronic Refractory Gout

Chronic refractory gout is a severe form of inflammatory arthritis with a significant impact on patients

How chronic refractory gout patients describe their flare pain



How long chronic refractory gout flares can last



7 to 14 days

Annual lost productivity (pts<65)

~25 days

Estimated # of patients diagnosed in US with chronic refractory gout

~160,000

Chronic disease can lead to sequelae including:

- Bone erosions
- Tophi
- Chronic pain
- Joint deformities
- Loss of function
- Disability

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Significant need for effective new therapies in chronic refractory gout

- **Improved efficacy, allowing patients to complete full 6-month therapy cycle**
  - Persistent reduction in Serum Uric Acid (SUA) levels
  - Elimination of tophi
- **Monthly dosing**
- **Gout flare reduction**
- **Avoidance of "off-label" and global immunosuppressive therapies**

SEL-212 has the potential to address these unmet needs and holds $1B+ market potential

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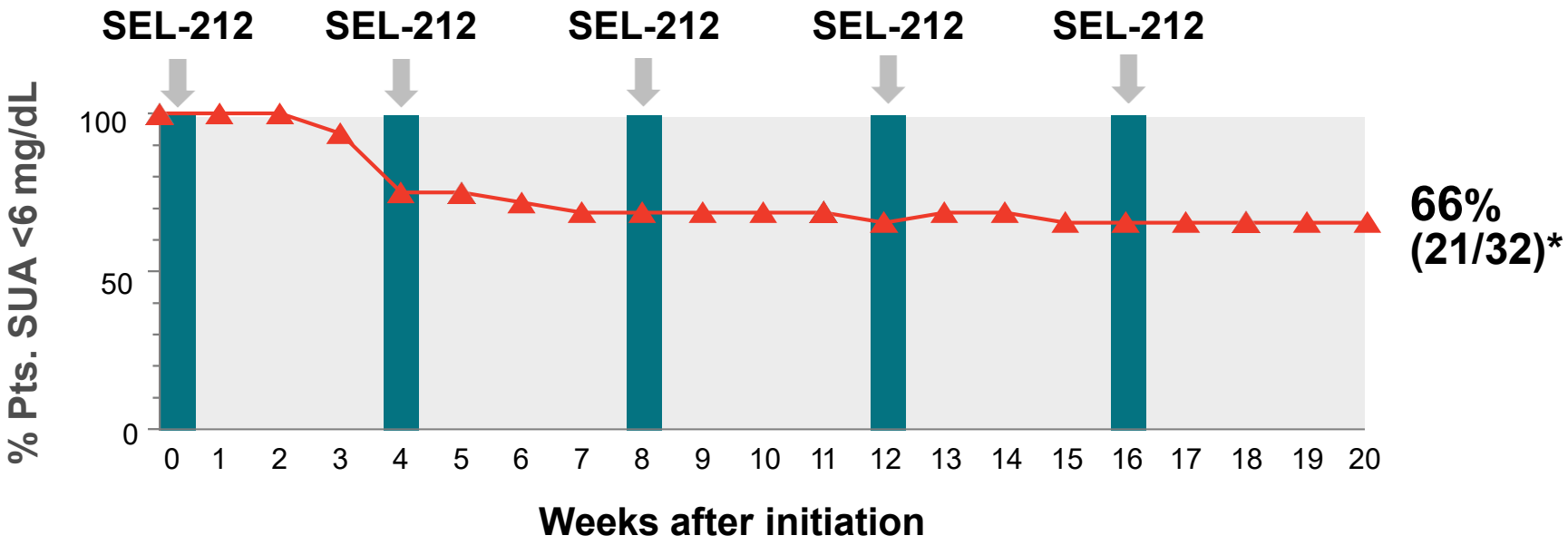
Sustained reduction of SUA with monthly dosing of SEL-212 was observed in Phase 2 dose ranging study

Phase 2 results after 20 weeks of once-monthly SEL-212 treatment:



66% of evaluable patients completed the 20-week period with an SUA level <6 mg/dL

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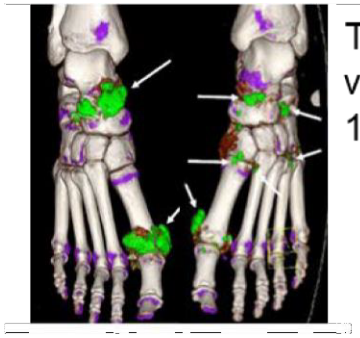
**Week 20 Evaluable patients = patients who received a full first dose and did not discontinue due to any measure other than drug effectiveness or drug related safety*

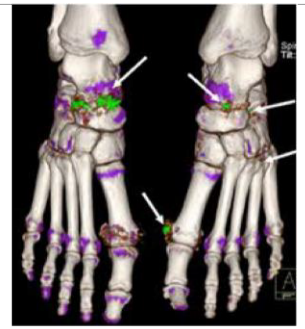
Dual energy computed tomography (DECT) scan images show reduction of tissue urate burden in Phase 2 dose ranging study

Baseline



Total urate volume 13.27 cm^3

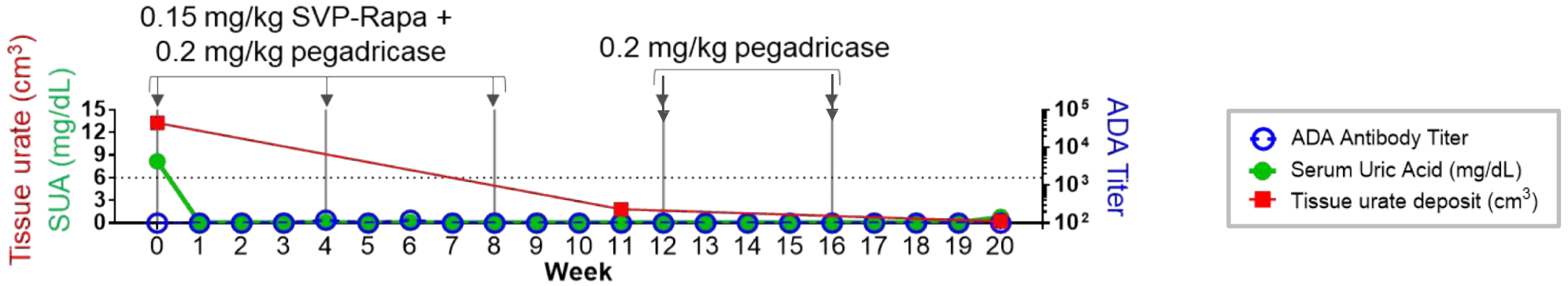
Week 11



Total urate volume 1.83 cm^3

Week 20

Total urate volume 0.24 cm^3

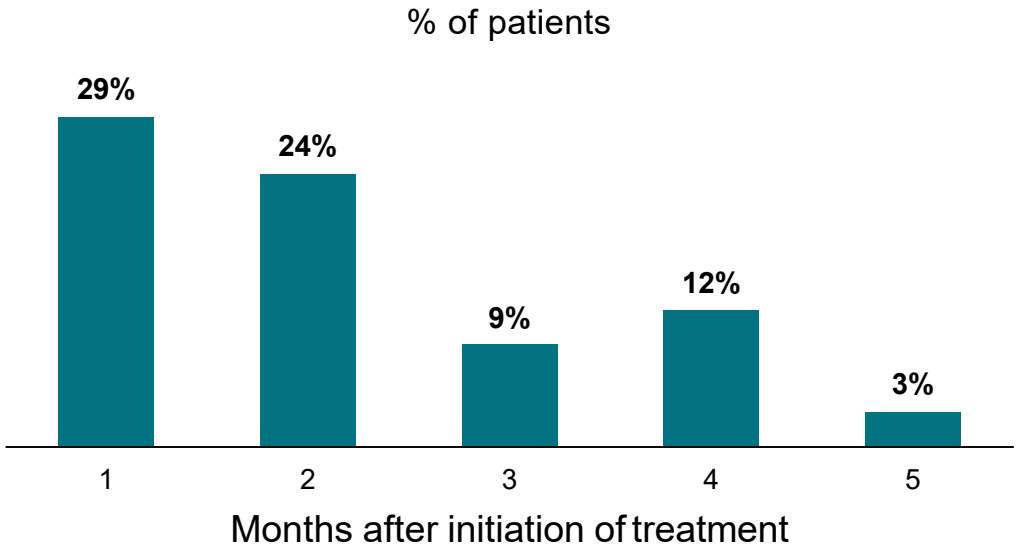


DECT uses a computer algorithm to produce color-coded images that render uric acid green, cortical bone blue, and trabecular bone purple

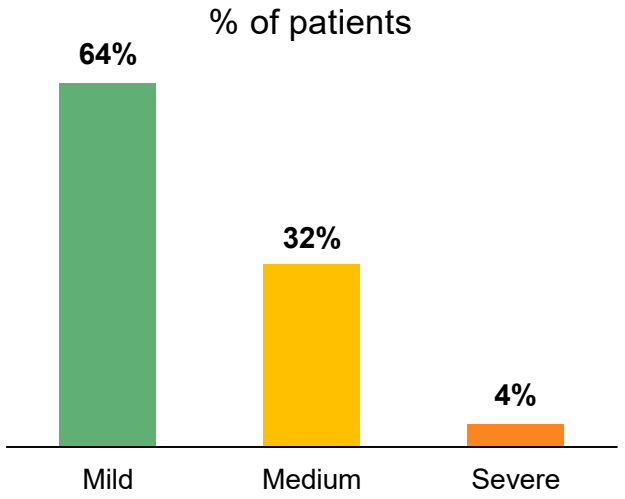
https://selectabio.com/wp-content/uploads/2018/10/ACR-poster-DECT-2018-FINAL-.pdf

Phase 2 dose ranging data showed reduced frequency and severity of flares during SEL-212 therapy

Percent of SEL-212 patients who had flares



Severity of flares



- **Majority of flares occurred in months 1 & 2, with no new patients who flared after month 2**
- **96% of flares were mild or moderate in severity**
- **No gout flares were classified as SAEs nor resulted in study drug discontinuations**

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Unaudited data reported as of October 09, 2018 | Clinicaltrials.gov NCT02959918

SEL-212 generally well-tolerated in the Phase 2 dose ranging study

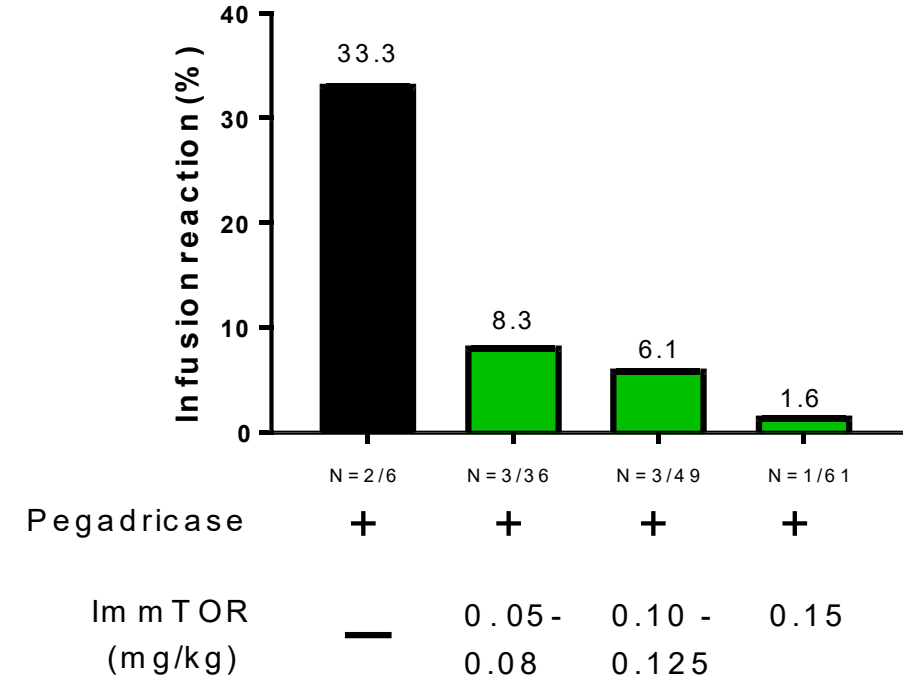
SEL-212 was generally well tolerated at clinically active doses following >470 administrations during the Phase 2 trial

23 SAEs reported in the Phase 2 trial

- 14 were reported not to be or unlikely to be related to study drug
- 9 were infusion reactions which decreased in incidence with increasing doses of ImmTOR

All SAEs were successfully treated without further issues

Serious infusion reactions (%)



Selecta Biosciences

Unaudited data reported as of February 25, 2019 | Clinicaltrials.gov NCT02959918

Head-to-Head (COMPARE) study: Comparing the efficacy of SEL-212 to pegloticase in gout patients refractory to conventional therapy

COMPARE

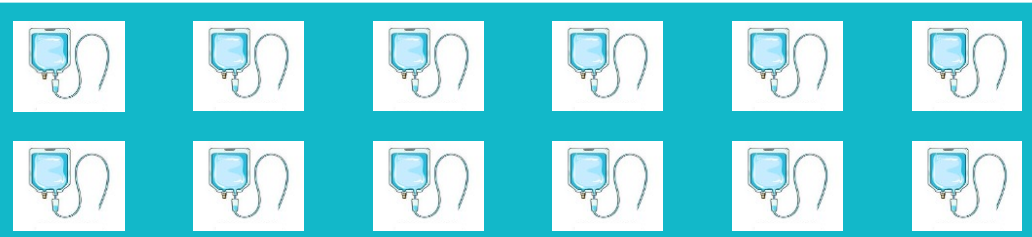
SEL-212 (N=~75)
6 Infusions
Once Monthly
0.15 mg/kg ImmTOR + 0.2 mg/kg of pegadricase

~150 Refractory Chronic Gout Patients

Randomized

- Primary Endpoint: Statistical superiority for SUA levels <6mg/dL at 3 and 6 months, 80% of the time
- Multiple Secondary Endpoints: Flares, QoL, HAQ, tophi resolution
- Safety Assessment

KRYSTEXXA® (N=~75)
12 Infusions
Every 2 weeks
8mg



Head-to-head trial is designed to provide objective, comparative results

- SUA level reduction, a robust primary endpoint for approval, can be seen soon after dosing
  - Easy to measure
  - Maintenance strongly correlated with low/negative drug-specific antibody titers
- Adult patient population with two active arms
- Opportunity to test revised stopping rules and de-risk Phase 3 program

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ImmTOR
in Gene Therapy

The ability to re-dose AAV gene therapy is a key goal to unlocking the full therapeutic potential

Dose titration

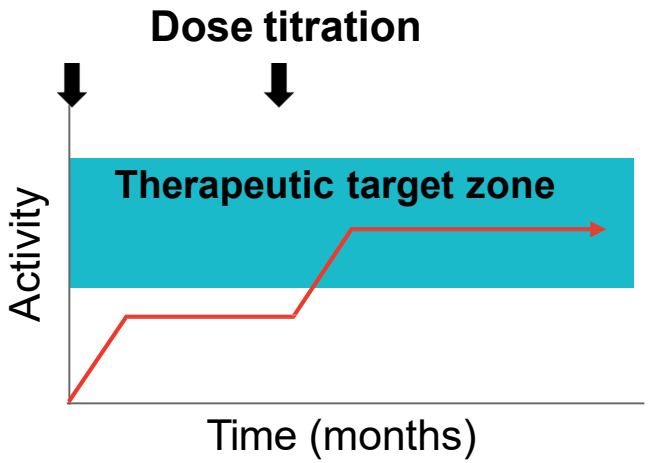
- Potential to increase proportion of patients who achieve therapeutic benefit without risk of overdosing
- Goal of improving enrollment in clinical trials

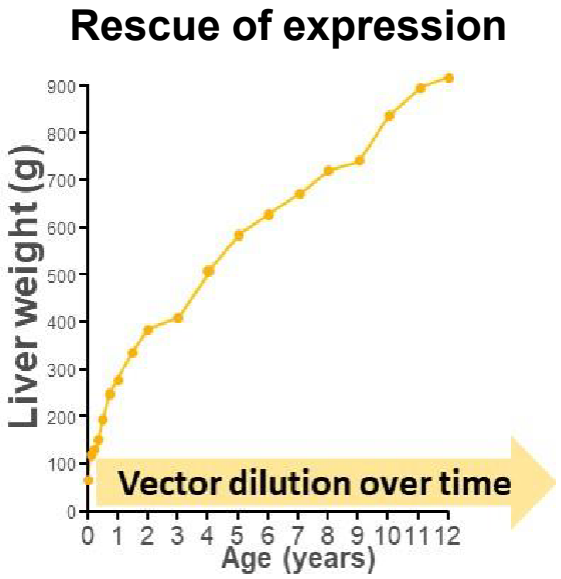
Multiple vector administrations

- Provide potential to target systemic diseases in which multiple vector administrations are likely needed to achieve full therapeutic efficacy

Rescue of expression

- Allows for potential rescue in patients with organ damage
- Potential to restore therapeutic expression in pediatric patients as they grow





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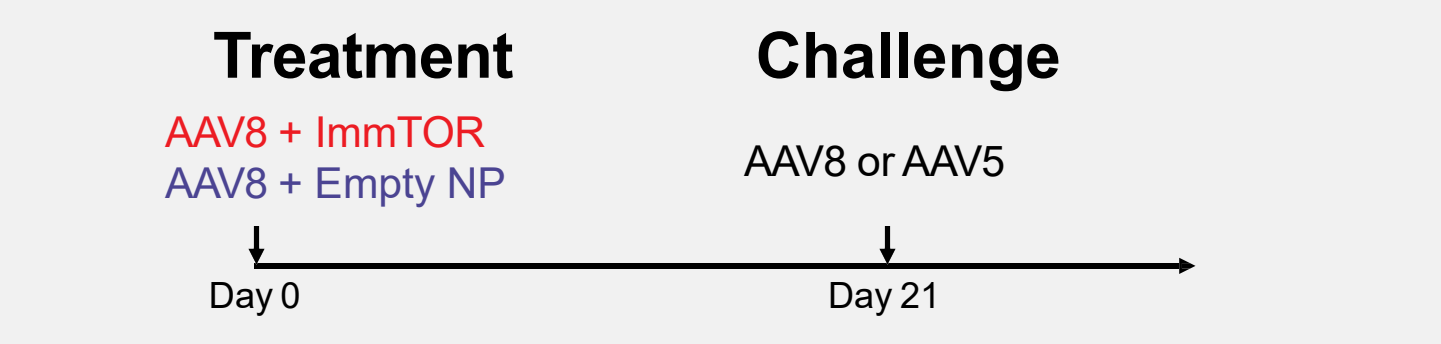
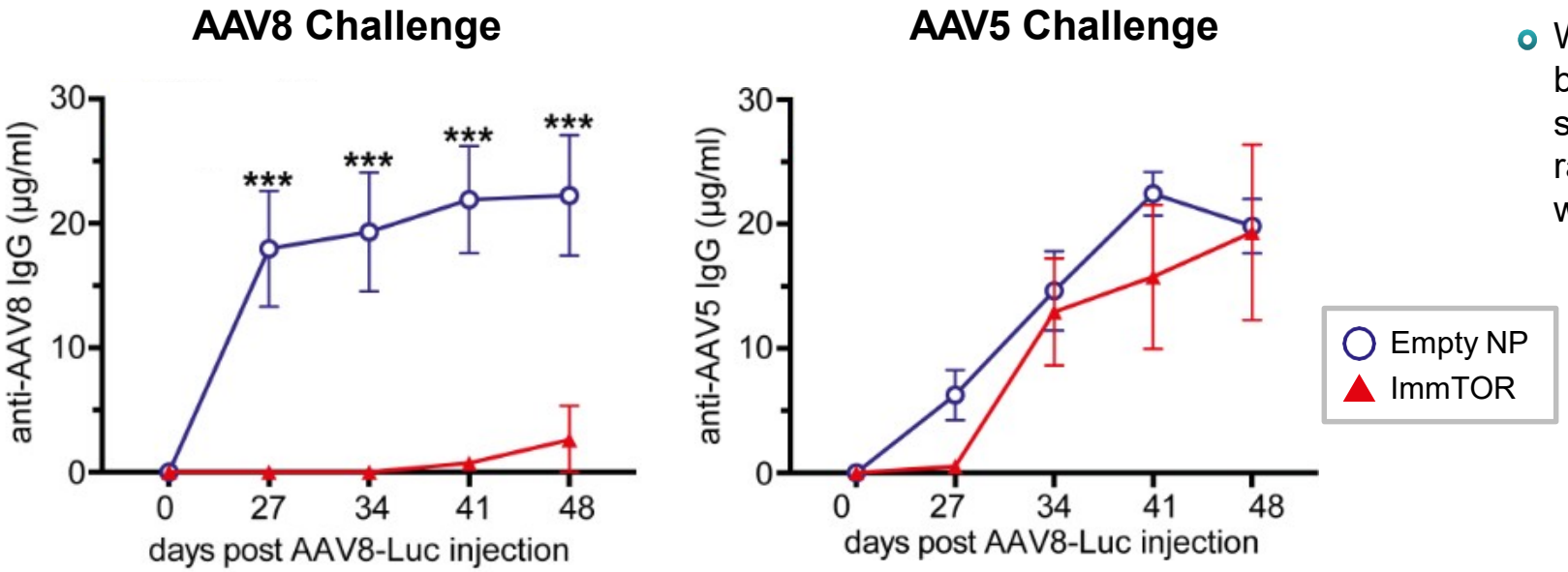
In preclinical studies, ImmTOR induced antigen-specific immune tolerance





ImmTOR provided AAV-specific immune tolerance

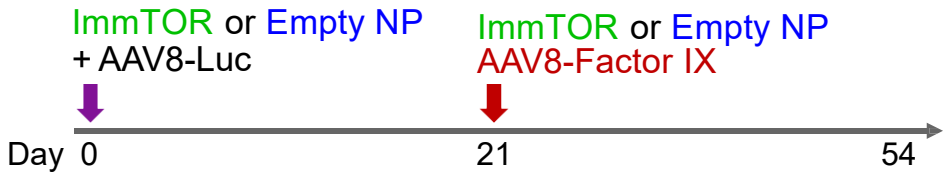
- NAbs did not develop in mice treated with ImmTOR+AAV vector
- Mice treated with empty nanoparticle (NP) + AAV vector developed significant IgG response
- When challenged with a different AAV vector, both arms mounted an immune response, suggesting antigen-specific immune tolerance rather than broad immunosuppression was achieved

Selecta Biosciences

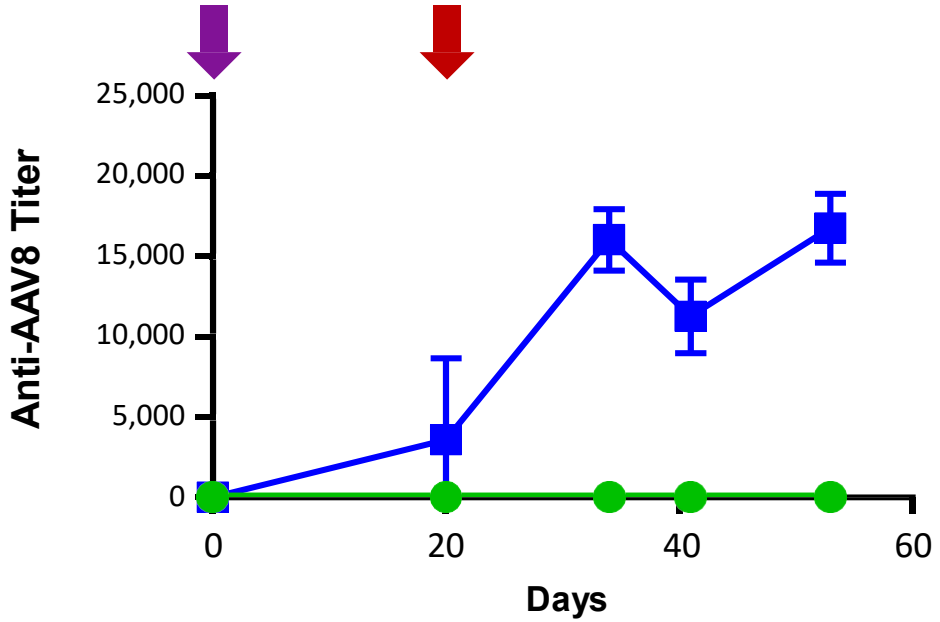
Meliani et al., *Nature Communications*, In Oct. 2018

Preclinical data indicates potential of ImmTOR-powered re-dosing in gene therapy

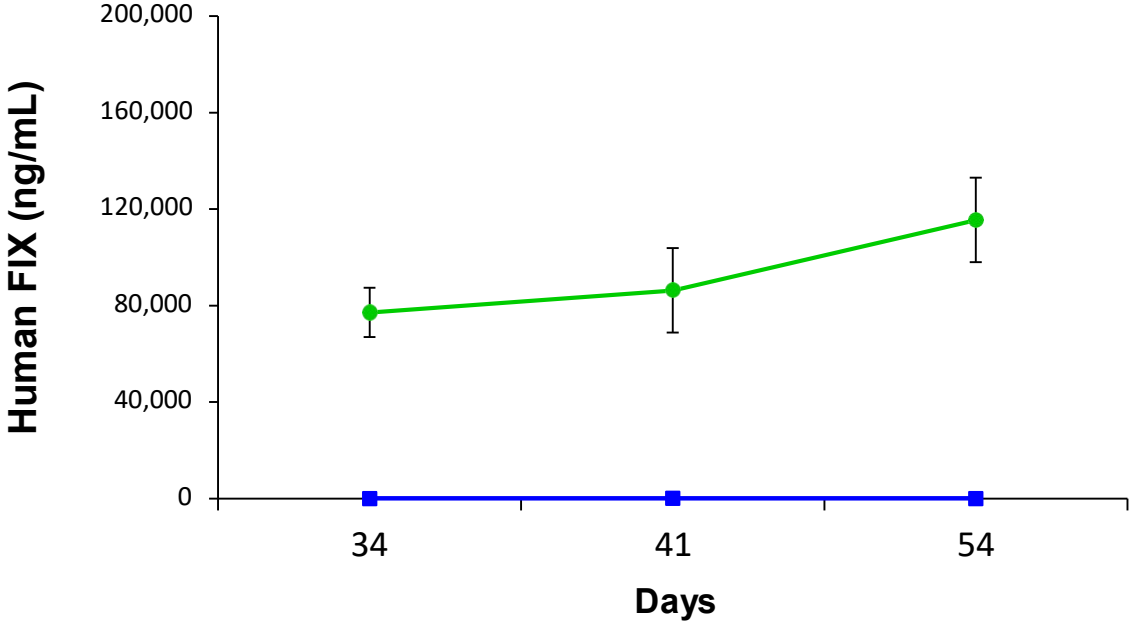
ImmTOR-powered AAV8 gene therapy has potential to be re-dosed without NAb formation or loss of therapy expression



Anti-AAV8 Antibody Titer



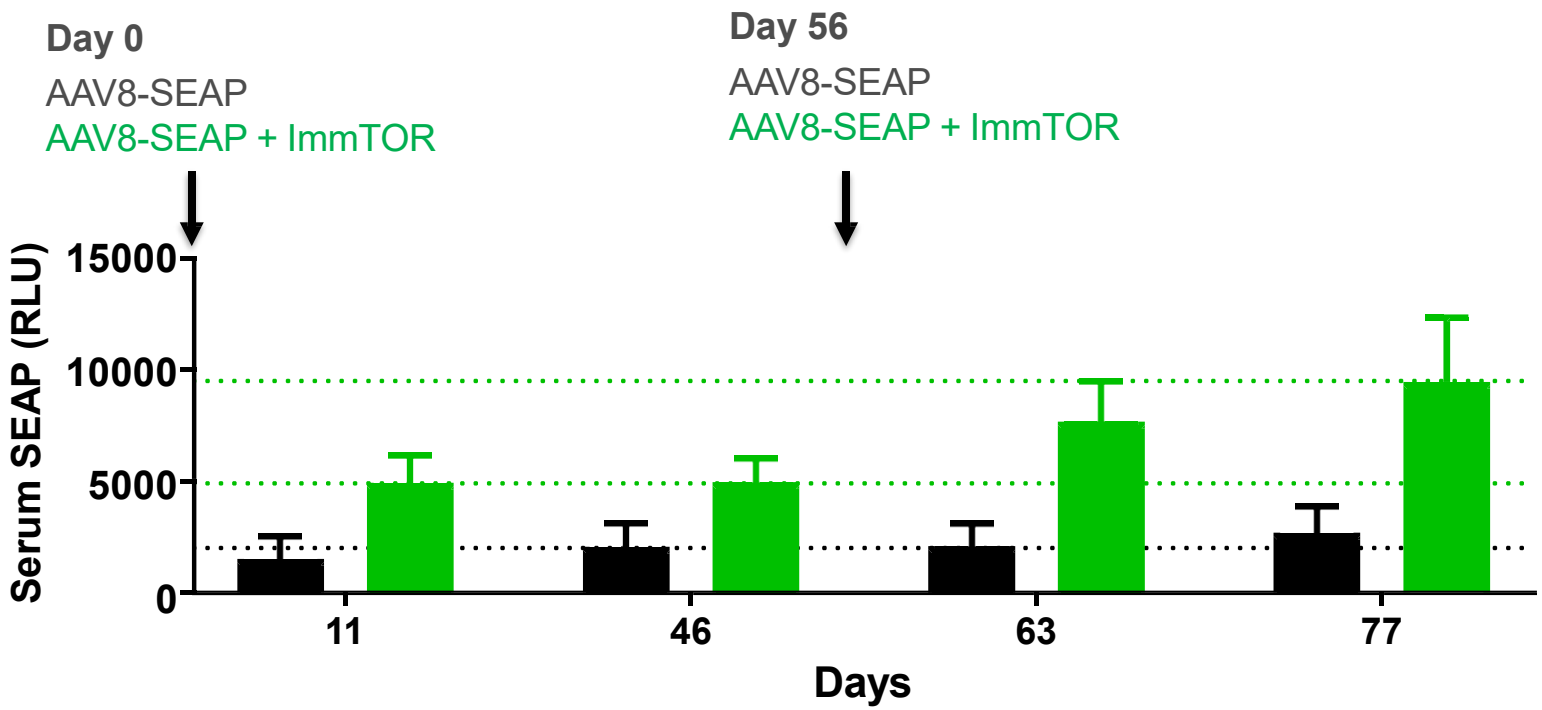
Serum Factor IX Expression



Selecta Biosciences

Meliani et al., *Nature Communications*, In Oct. 2018

First dose benefit of ImmTOR on liver-directed transgene expression



First dose benefit is immediate and independent of effect on adaptive immune response

Cumulative benefit of first dose and repeat dose provides up to 4-fold increase in transgene expression

Selecta Biosciences

Ilyinskii et al., *Tolerogenic ImmTOR™ nanoparticles enhance vector transduction, mRNA synthesis and transgene expression after initial and repeated administrations of AAV-based gene therapy vectors*, Nov. 2019

Opportunities for clinical POC in gene therapy

Collaboration

- **AskBio**
  - Development pipeline and human trials planned for repeat dosing of AAV-based gene therapies to address the unmet medical need for patients with rare and orphan genetic diseases
  - Lead indication is MMA (Methylmalonic Acidemia)
  - *Expect to enter the clinic under this collaboration in 2020*

Proprietary Program

- OTC (Ornithine Transcarbamylase deficiency)

License Agreements

- **AskBio**
  - Licensed ImmTOR for pompe disease in December 2019; Selecta received upfront payments of $7 million and is eligible for clinical and sales milestone payments of $237 million
- **Spark Therapeutics**
  - Licensed ImmTOR for hemophilia A

Selecta™ Biosciences

Financial Overview and Projected Milestones

Financial snapshot

(In thousands)	For the Year Ended December 31, 2019
Research & Development Expenses	$42,743
General & Administrative Expenses	$16,389
Total Operating Expenses	$59,132
Cash used in Operations	$51,435

(In thousands, except shares outstanding)	As of December 31, 2019
Cash, Cash Equivalents, Marketable Securities, Restricted Cash	$91,551
Basic Shares Outstanding	86,325,547

Cash runway into 2021

Selecta Biosciences

Projected upcoming milestones

- SEL-212
  - Report top-line data in head-to-head (COMPARE) trial of SEL-212 against pegloticase in chronic refractory gout (3Q 2020)
  - Commence Phase 3 clinical program against placebo (2H 2020)

- Gene Therapy Program
  - Commence human POC trial under AskBio collaboration (2H 2020)

Selecta™ Biosciences

OUR PURPOSE

Relentlessly committed to overcoming IMMUNOGENICITY with our pioneering ImmTOR immune tolerance platform to transform the lives of patients and their families

Selecta Biosciences